Thermal Printer

4000PMH series

Operation Manual

Version 1.10

For the safety

- **Please read trough carefully and use our product properly.**
- **The listed bellow are very important for using our product safely therefore please comply with the instructions.**
- **The denotations and meaning are as following.**

Warning	There are possibility of death or serious injury for wrong operation.
Caution	There are possibility of injury physical damage for wrong operation.

* The physical damage represents damage on such as house hold article, domestic animal and so on.

Example of flow chart symbol :

	△ represents cautions (danger, warning). The contents is indicated inside of △ . The character on left represents the caution for electrification.
	⃠ represents the prohibition. The contents is indicated inside of ⃠ . The character on left represents the prohibition of decomposition.
	● represents the compulsions. The contents is indicated inside of ● . The character on left represents the compulsion of pull out of power cable.

Warning

Please stop the operation in case of noise, smoke, abnormal smell, or abnormal temperature occurrence.
That might cause electrification or fire.
Please turn off the power switch and plug out power cable. Remove the battery in case of battery type. Never decompose the printer by yourself.

Do not decompose or convert the printer for the repair.
(Exclude the case of following manual instruction)
That might cause injury, electrification or fire.

Do not use power supply other than specified power supply.)
That might cause electrification or fire.

Do not operate the printer with incursion of foreign material, liquid such as water, oil, and piece of metal such as clip, pins.
That might cause electrification or fire.
Turn off the power switch immediately and remove the power cable.
Remove battery in case of battery type.

Do not use defected power cable.
That might cause electrification or fire.
Please follow the following instruction for handling power cable.

a) Do not locate any object on the power cable.
b) Do not pull, bent or twist the power cable.
c) Do not convert power cable.
d) Keep heating equipment away from power cable.

Do not do star-burst connection nor use auxiliary mains socket outlet located on back of table tap or PC.
That might cause the electrification or fire.

Warning

Do not use power cable other than included power cable.
That might cause the electrification or fire.

Please handle the power plug properly.
Wrong handling might cause the electrification or fire.
Please follow the following instructions for handling power plug.

a) Remove foreign material or dust before plug in.
b) Plug in all the way to the end.
c) Do not use loose plug socket outlet.

Removing power plug.

a) Insert or remove the plug by holding plug part. Do not pull cable part to remove the plug. That might cause the defection of the cable and cause fire.

b) Please unplug the power cable in case of not using for long time. Unplug the cable with dry hand. Handling of the power cable with wet hand might cause electrification.

Do not unplug the power cable with power switch on. It might cause deformation of plug or fire.

Do not add any impact to power cable as they are made by precision parts.

Turn off the power switch before connecting communication cable or options.
That might cause electrification.

Caution

Locate the printer at leveled stable place to avoid the printer to fall down. That might cause injury.

Locate the printer where children can not reach.
The falling down of the printer might injure the children.

Do not step on the printer or place heavy object on the printer.
That might cause some injury by printer to fall down.

Please turn off the power switch and check if every connector has been detached before removing the printer.

Do not locate the printer where there is no ventilation.
That might cause fire as heat stays inside of the printer.
Do not locate the printer in following places.

1. Closet or Book shelf.
2. On carpet or blanket.
3. Do not cover with cloth.

Note : The outer case will get high temperature during the operation. Keep the space of more than 5 cm between the printer and the surroundings.

Do not place the printer at humid or dusty place.
That might cause electrification or fire.

Locate the printer where there is no vibration.
The vibration might cause defection of the printer.
Also, the vibration might cause the printer to fall and cause some injury.

Keep finger away form paper vent part or inside of the printer during the operation or by the time of power on.
That might cause finger to be caught under the mechanism such as platen or peel roller.

Do not use paper and ribbon other than that is recommended by us. Using other supplies might cause defection of the printer.

Please attention for injury.

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Introduction

Thank you for purchasing PMH series thermal transfer barcode printer.
Your printer allows you to put an OCR character, barcode, and ordinary character and graphic character, on an ordinary paper-made label in high quality by using a thermal transfer ribbon.
Besides, you can also use it as a thermal printer using a thermal paper.
Please read the manual thoroughly to make full use of the capabilities of the printer and to handle it properly before using your printer.
Keep the manual and the related documents included with the product on hand to solve your question.
See the reference manual about the program preparation for control over the printer.
Also, we can provide the general-purpose package software that you can make label from for the models freely and easily.

Package list :

PMH series thermal transfer barcode printer	1
Power cable	1
Operation Manual	1

Note : The cable for connecting to a host computer is not included.

Chapter 1 Feature of PMH

In addition to the basic print such as alphanumeric characters, graphic characters, OCR and the like, this printer series have their own characteristics as shown below.

(1) Since the printer measures label length automatically(in the feed direction) with label position control, replacement between various kinds of labels in length does not require troublesome preparation by users.

(2) To cut running costs, the gap between labels is well enough to be 2 mm at least. (if you use the cutter for label, 4 mm requires at least) To decrease unprintable area in the cutter, peel off and tear off mode, the printer has back feed feature.

⑶ Label printing having the same format and layout allows continuous print out, which results in increasing print performance.

(4) An adjustable print density allows a fine tuning for print with good quality.

(5) The ability to adjust the print starting position in fine increments allows fine adjustment of the printing position.

(6) Easy return from errors (paper empty, paper jamming, no ribbon, print head open) that occur halfway through printing and the data saving function that can save data immediately before error occur allow you to continue a normal operation with the minimum loss time.

Chapter 2 Environment

2-1 Please try to install the printer with following conditions.

1. Stable leveled place.
2. Ventilated place.
3. Temperature of 10 to 35 centigrade and humidity of 20 to 80%.

2-2 Please do not install the printer in the conditions below to avoid being defected as the printer is composed by precision parts.

1. Direct sunlight
2. Grime and dust
3. Rapid temperature change
4. Rapid humidity change
5. Near flame
6. Near water
7. Near volatile material
8. Near air conditioner
9. Near Humidifier
10. Vibrations

2-3 About power supply

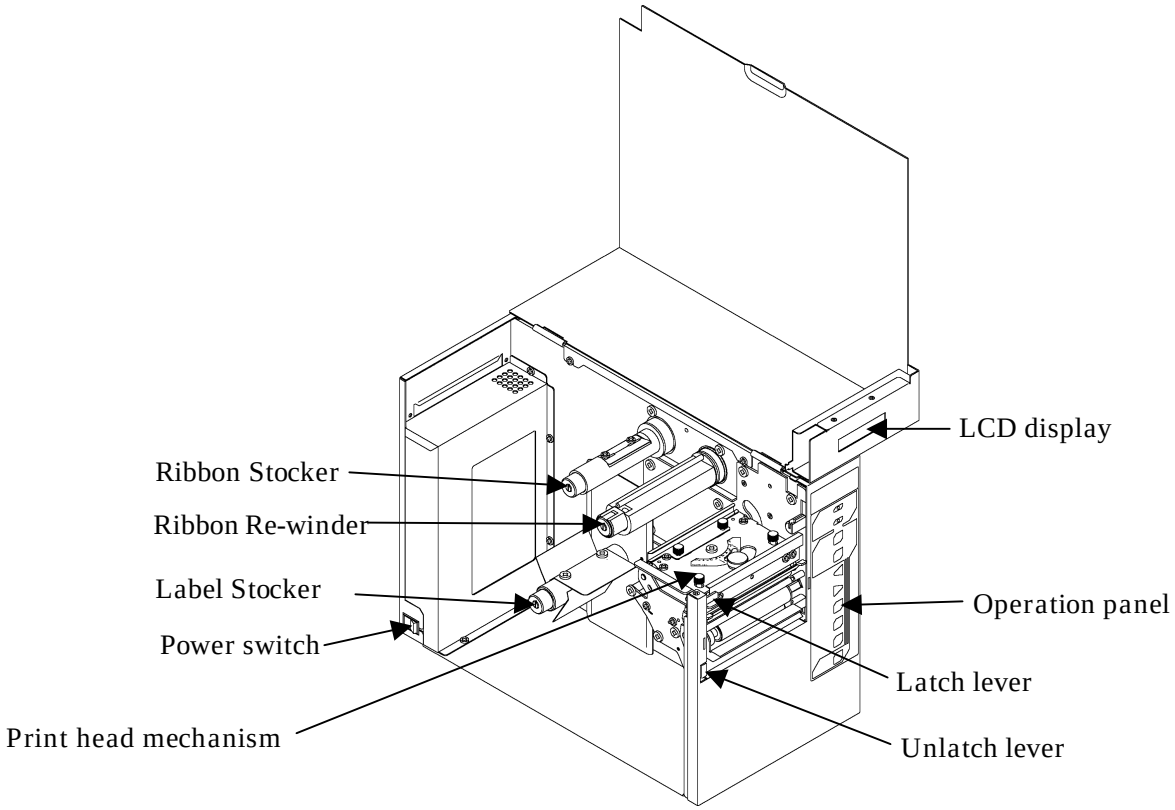
1) The voltage range : AC100 to AC260 50/60Hz.
(4012/4016/4024PMH : Auto switch power supply)
(4012PMH(300 mm/sec.), 8012PMH : Switch-able power supply)
2) Do not take power from source that might generate noise. (Such as Motor).

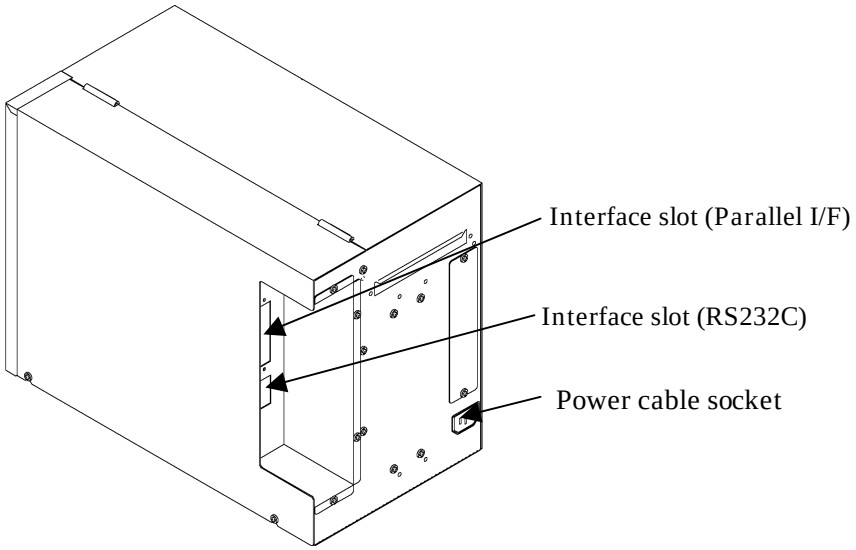
2-4 About environment

1) Operating temperature is 5 to 40 centigrade.
Prevent condensation by keeping relative humidity under 85 % RH.
2) Install the printer on leveled place with no vibrations.
3) Do not block the ventilation on of printer. Try to leave the space of at least 5 cm around the printer.
4) Never do a polishing work using a grinder or a sand paper beside your printer. The printer hates dusts, especially, such as high hardness dusts, sands, metallic dust particles, because they might cause the failure of a print head. Pay careful enough attention to avoid the above dusts. Also, never use your printer in a dump place or in a dusty place having an oil/iron content dust.
5) Please do not install the printer near TV or Radio. The electric wave might cause some noise to the equipment.
6) In case of using the printer under the condition where electrostatic occurs, please try to use equipment like “Electrostatic prevention mat” to prevent the electrostatic.

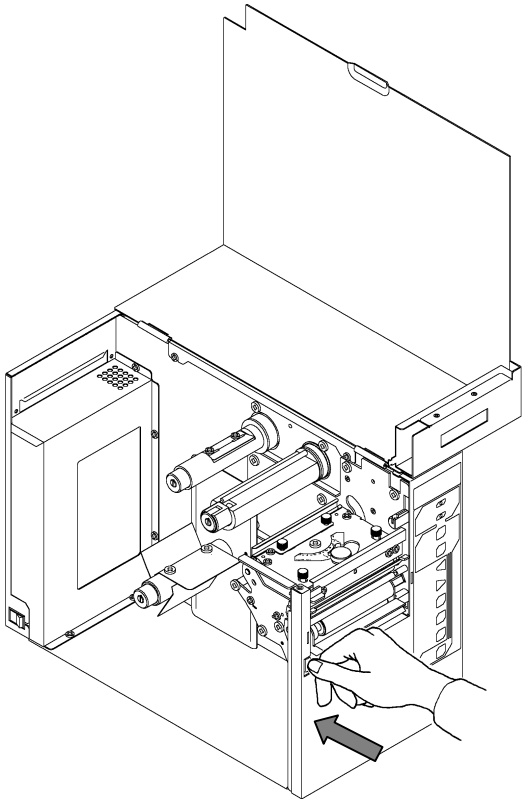
Chapter 3 Handling

3-1 Designation of each part

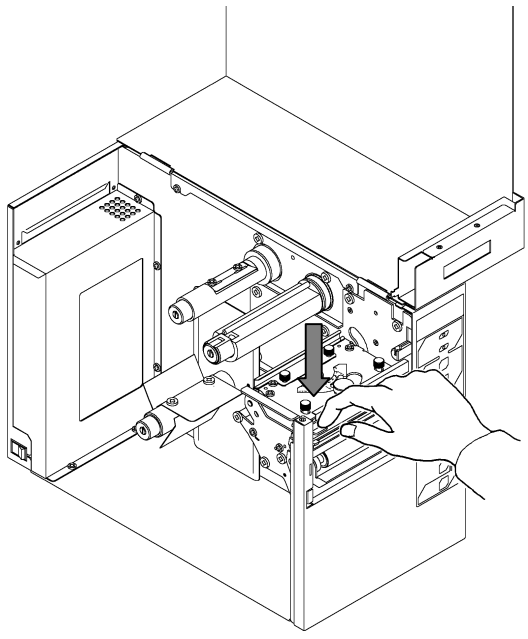




3-2 Opening/Closing the cover of the print mechanism



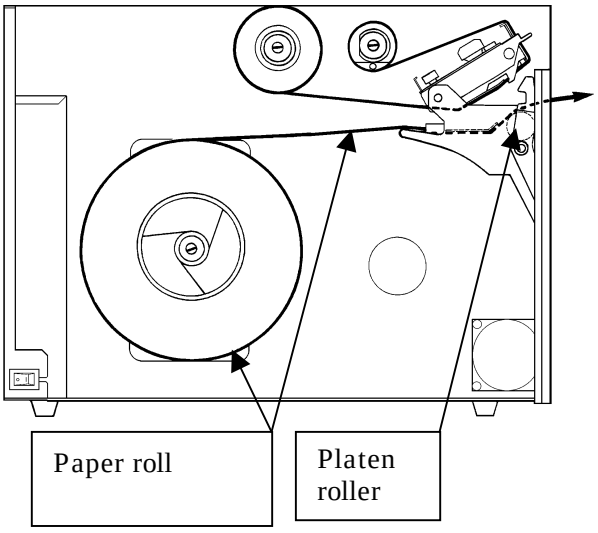
1) Press Unlatch lever to arrow direction to unlatch print mechanism.



2) Press down Latch lever to arrow direction completely to close print mechanism.

3-3 Loading paper roll and thermal ribbon

3-3-1 Installation of paper roll

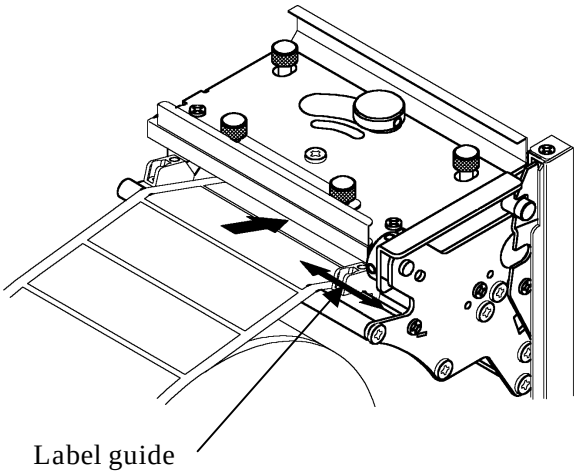


1）Load the paper roll to Label Stocker all the way to metal plate.

2) Open print mechanism.

3) Run paper through the printer as the drawing on the left.

4) In case of using Peel off mode, run paper through between Platen roller and Peel roller. instead.

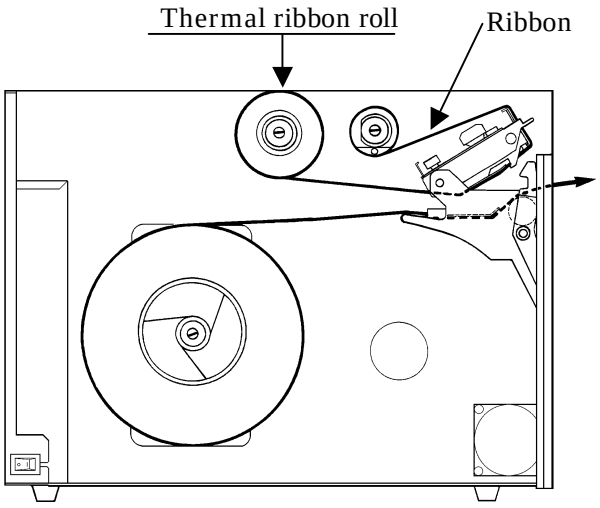


5) Set Label guide to about 1 mm wider than actual label width by sliding it.

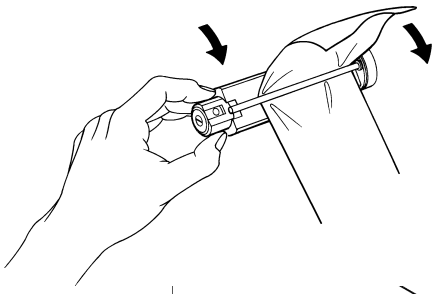
3-3-2 Installation of thermal ribbon

1) Load the thermal ribbon roll to Ribbon Stocker all the way to the end.

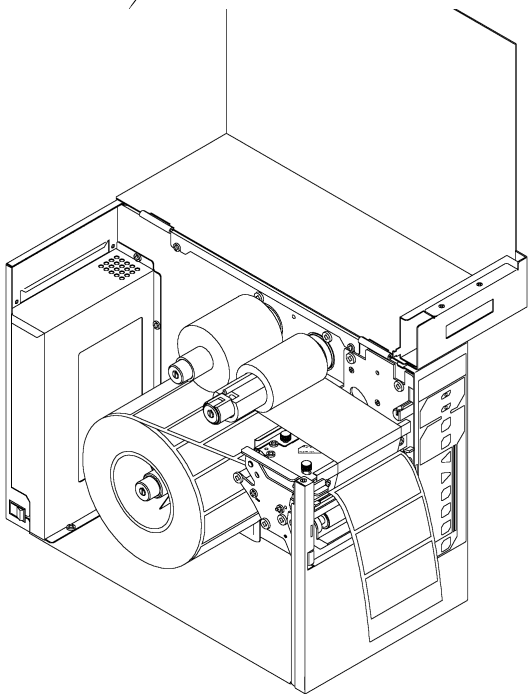
2) Open print mechanism and run ribbon through the printer as the drawing on the right.



3) Set the edge of ribbon to Ribbon Re-winder as the procedure below.
   a) Run the leading edge of ribbon through under metal bar of Re-winder.
   b) Rotate the Re-winder by hand to arrow direction several times.



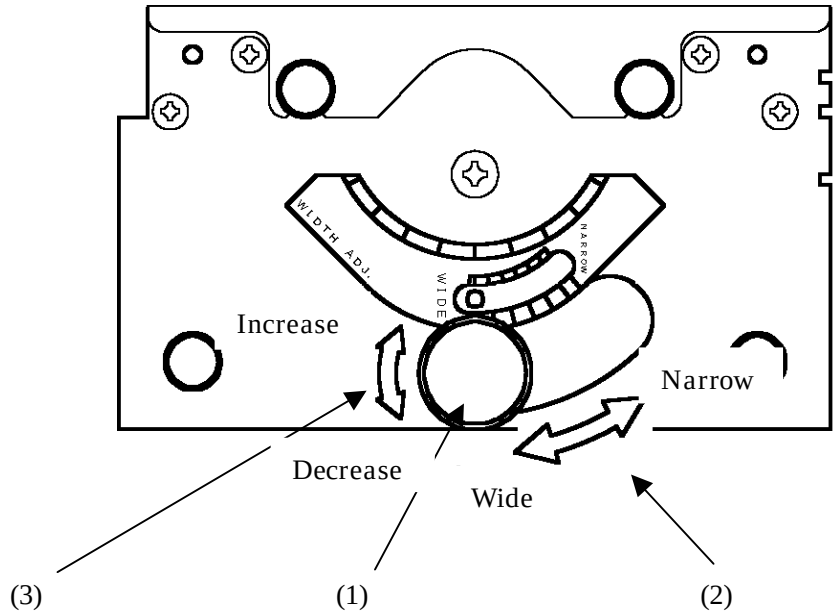
4) Close print mechanism completely.



3-4 Adjustment of paper width

If the printed output is poor in quality or light only on one side due to a paper width or paper thickness, readjust the print pressure as follows. (Because the print pressure often influences print quality.)

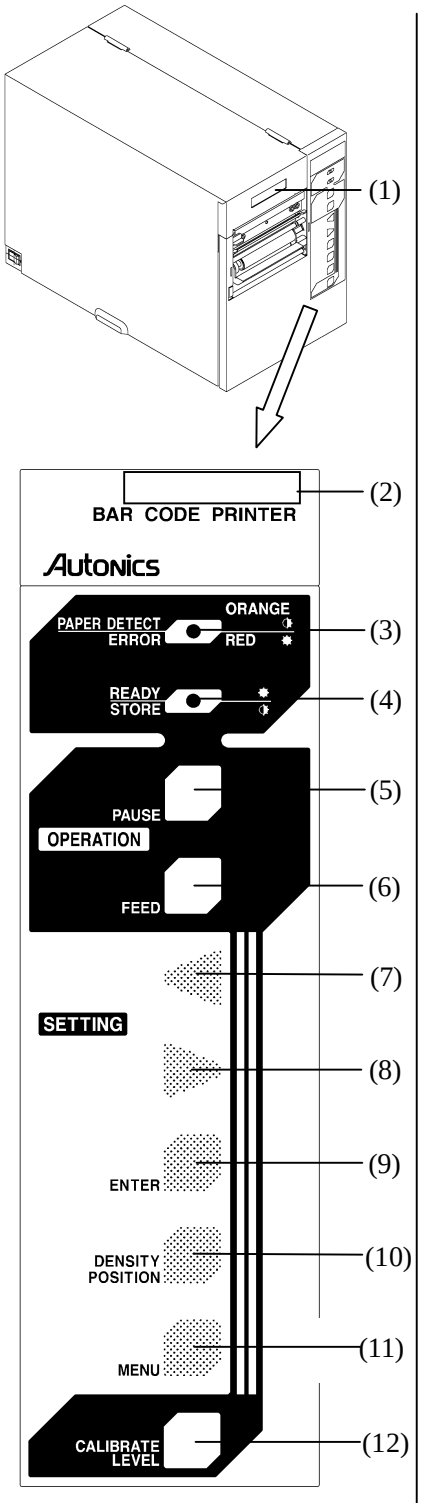
Upper veiw of the print mechanizm



1) Locate the Knob(1) to center of paper you use by sliding. The Knob (1) will be moved easier if you unlatch the print mechanism.
2) Rotating Knob 1 clockwise to increase the pressure and rotate counter clockwise to decrease the pressure.

Note : Use "Test Print" to to check the print quality. (Ref. 3-7)

3-5 Explanation of Operation panel



(1) LCD display :
Displays the status of printer by 16 digits x 2 rows.
Please refer the followings for more details.

(2) Printer model name :
Contents in box varies depend on the model.

(3) PAPER DETECT / ERROR
The red light blinks and buzzer sounds in case of errors appearance.

(4) READY / STORE
The green light turns on at “Ready” and blinks during data transmission to memory such as in case of Firmware update.

(5) PAUSE
The button to switch “Ready” to “Pause”.

(6) FEED
The button to feed the paper from “Pause” status.

(7) Left ARROW
The button to change values and selects mode.

(8) Right arrow
The button to change values or selects mode.

(9) ENTER
The button to fix or executes the selected functions.

(10) DENSITY / POSITION
The button to adjust density, position, and cut position.

(11) MENU
The button to chose operation mode such as speed, print mode, print method

(12) CALIBRATE LEVEL
The button to execute automatic HP adjust and paper calibration.

3-6 Procedure of operation

The contents in [ ] represents front panel button and ‘ ’ represents LCD display.

3-6-1 Operation with Die cut label

The followings are the procedure for using Die cut label for the first time after purchasing the printer or changing to different size of Die cut label.

1) Connect power cable to the printer.
2) Connect interface cable to the host PC.
3) Load Die cut label and thermal ribbon to the printer.
4) Turn power switch on.
5) Check if the LCD shows “Ready”.
6) Execute HP level adjustment and calibration.
   A) Press [PAUSE] to show ‘Pause’ on LCD.
   B) Press [CALIBRATE LEVEL] to show ‘Calibrate Level/Length 60 mm’.
   (Note : 60 mm is default value)
   C) Change the value to the length of “Label length + 20 mm) by [◀] [▶]
   D) Press [ENTER] to execute the calibration. The printer starts feeding several labels for the calibration and goes back to ‘Ready’ as it completes.

   Note : Please refer “Chapter 6 Errors” in case of error occurrence.

7) The printer starts printing as it receives data from host PC.

   Note : Please refer “3-7 Test Print” for executing the test print.

From next time, the printer will be ready to handle the label as you turn on the power switch as long as it is same label.

3-6-2 Operation with Continuous label

The followings are the procedure for using Continuous label for the first time after purchasing the printer or changing to Continuous label from Die cut label.

1) Connect power cable to the printer.
2) Connect interface cable to host PC.
3) Load only thermal ribbon and latch the print mechanism.
4) Turn power switch on.
5) Change 'Label Type' to 'Continuous' by front panel.
   A) Press [PAUSE] to show 'Pause' on LCD.
   B) Press [MENU] for several times to show 'Label Type / Die cut' on LCD.
   C) Press [▶] to select 'Continuous'.
   C) Press [ENTER] to register.
   D) The LCD shows 'Set Label Pitch / 53 mm'.
   E) Press [PAUSE] to show 'Pause' on LCD.
6) Execute HP level adjustment and calibration.
   A) Press [CALIBRATE LEVEL] and show 'Calibrate Level/Length 60 mm'.
   B) Press [ENTER] to execute calibration. The LCD shows 'Calibrate Level / Busy !!' and goes back to 'Ready'.

Note : Please refer "Chapter 6 Errors" in case of error occurrence.

7) Open print mechanism and load the Continuous label and close print mechanism. Stop the beep sound by pressing [PAUSE].

8) Press [PAUSE] again to clear 'E01 / Head Open' and show 'Pause' on LCD.
9) Press [PAUSE] again. The printer feed the label and goes back to 'Ready'.
10) The printer starts printing as it receives data from host PC.

Note : Please refer "3-7 Test Print" for executing the test print.

From next time, the printer will be ready as you turn on the power switch as long as using same label.

3-6-3 Switching Die cut to Continuous label

The followings are the procedure to change Continuous label into Die cut label.

1) Load Die cut label and thermal ribbon to printer.
2) Turn power switch on.
3) Change 'Label Type' from 'Continuous' to 'Die cut' by front panel.
   A) Press [PAUSE] to show 'Pause' on LCD.
   B) Press [MENU] several times to show 'Label Type / Continuous' on LCD.
   C) Press [◀] to select 'Label Type / Die cut'.
   D) Press [ENTER] to register. The LCD will displays 'Measure Label / Manual'.
   E) Press [PAUSE] to show 'Pause' on LCD.
4) Execute HP level adjustment and calibration.
   A) Press [CALIBRATE LEVEL] to show 'Calibrate Level / Length 60 mm'. (Note : 60 mm is default value)
   B) Change the value to the length of "Label length + 20 mm) b[◀] [▶]
   C) Press [ENTER] to execute the calibration. The printer starts feeding several labels for the calibration and goes back to 'Ready'.

   Note : Please refer "Chapter 6 Errors" in case of error occurrence.

8) The printer starts printing as it receives data from host PC.

   Note : Please refer "3-7 Test Print" for executing the test print.

From next time, the printer will be ready as you turn on the power switch as long as using same label.

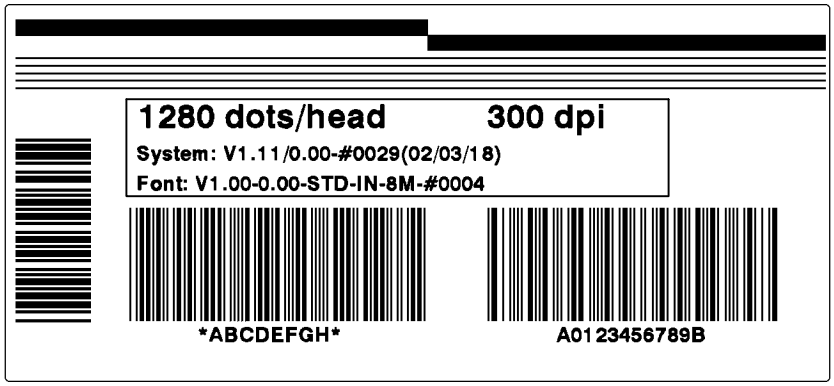
3-7 Test Printing

Please take procedure in "3-6 Procedure of operation" and show 'Ready' on LCD previous to the Test Printing.

1) Press [PAUSE] to show 'Pause' on LCD.
2) Press [FEED] several times to feed the label and check if the label runs straightly (without meandering) and also check the absence of ribbon wrinkle.
3) In case of appearance of the ribbon wrinkle, open the print mechanism and take up the slack of ribbon by rotating the Ribbon Re-winder by hand. Then close the print mechanism.
   The beep sound will ring as you open the print mechanism. Press [PAUSE] to stop the sound. Press [PAUSE] again to show 'Pause' on LCD.

4) Press ◀ and ▶ at same time. The LCD will displays 'Test Print / Pattern 1'.
5) Press [ENTER] to execute the test printing.
   Press [PAUSE] to stop and restart the test printing.

Example of test print :



The contents inside the [ ] varies depend on the printer type and ROM version.

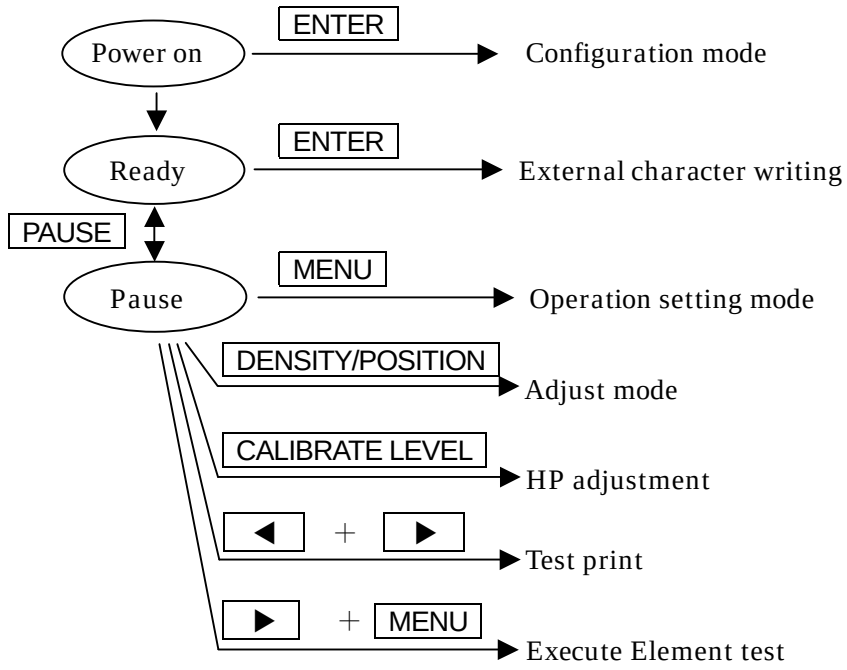
Chapter 4 Functions and settings

4-1 Panel functions

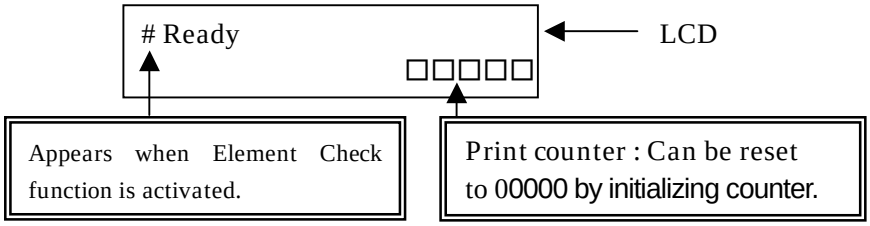
This chapter describes how to customize the printer's function for your use with the panel buttons. Please refer "4-1-7 Table of panel functions" for list of functions.

Mode	Function	Reference
Configuration mode	Initial setting of printer	4-1-1
Operation setting mode	Sets operation and communication	4-1-2
Print adjustment mode	Sets density and position	4-1-3
HP adjustment	HP adjustment and calibration	4-1-4
Test print	Test print	4-1-5
Element Check	Activate Element check function	4-1-6
External character	Writes registered external character into ROM	4-1-6
Other panel setting	Reprint, Reset, Others	4-1-6

Outline of mode change operation



Explanation of LCD contents


Ready
□□□□□
LCD
Appears when Element Check function is activated.
Print counter : Can be reset to 00000 by initializing counter.

4-1-1 Configuration mode

Initial setting of the printer is done in this mode.

A) Turn power on while pressing [ENTER] to show 'Configuration' on LCD.
B) Press [ENTER] to proceed.
C) Press [◀] [▶] for selection and press [ENTER] to register.
D) Press [PAUSE] twice to exit from this mode.

1) Interface : 'Interface / □□□□'
Function : Selects interface type for communicating with host PC.

Type	RS	For using RS232C interface.
	Parallel	For using parallel interface.
	LAN	For using LAN interface (100 BASE-TX).
	USB	For using USB interface (USB V1.1)

A) Only one optional interface can be selected.
B) Only selected interface can communicate with host PC.
C) Parallel interface in one way. Therefore can not receive the status from host PC.
D) The settings become valid after exiting from Configuration mode.
E) The default is set as 'RS'.

2) Command : 'Command / □□□'.
Function : Selects command type.
Type : ALL Function with standard command.

Please refer ALL command reference manual for the details.

3) Character code : 'Character Code / □□□□□□'.
Function : Selects Kanji Code type.

Type	Shift JIS	For using Shift JIS data.
	JIS	For using JIS data.

・The type need to much with data to hande.
・The settings become valid after exiting from Configuration mode.
・The default is set to Shift JIS.

4) Home position sensor : 'HP sensor / □□□□'.
Function : Selects HP sensor type.
Type : Transmit, Reflect(Option).
A) The sensor type need to be selected for paper type to use.
B) The settings becomes valid after exiting from Configuration mode.
C) The default is set as 'Transmit'.

5) Count Dictation : 'Count Dictation / □□□□□'.
Function : Selects the way of display for counting.

Type	None	For not displaying counting.
	Repeat	For displaying the count by repeat.
	Total	For displaying the count by total.

- The print number is at bottom line of LCD.
  Repeat : '□□□□□/□□□□□' : Print Label/Specified number
  Total : '□□□□□' : Number print label after power on of printer.
- The counter can be reset by initializing counter or reset of printer.
- The settings becomes valid after exiting from Configuration mode.
- The default is set as 'Repeat'.

6) Feed Speed : 'Feed Speed / □□□'.
Function : Selects the speed of feeding.
Range : + 00 to +99
- The settings becomes valid after exiting from Configuration mode.
- The default is set as " +00".

7) Plane format : 'Plane format／□□□'.
Function : Selects number of drawing memory.

Type	Single	
	Double	
	Triple	

- Change only in case of expanding printing area.
- The settings become valid after exiting from Configuration mode.
- The default is set as 'Triple'.

8) External character writing : 'Ext-Font Save／□□□□□'
Function : Select the way of writing external character into internal ROM.

Type	Auto	Writes external character into internal ROM automatically without command.
	Manual	Writes external character into internal ROM with panel setting.

- Pressing [ENTER] at '$ Ready' status after the external character registration will starts the writing of external character into ROM. Please refer '2) External character writing' at '4-1-6 Other panel setting" for details.
- Makes external character available by calling up it from printer.
- The settings become valid after exiting from Configuration mode.
- The default is set as 'Manual'.

9) Element test : 'Element Check／□□□□□'

Function : Selects the way of element test for print head element.

Type { Auto — Executes element test automatically.
Manual — Executes element test manually.

・The check timing of element test.

In case of 'Auto'.

It executes the test during waiting status except by the time of error occurrence and printing.

In case of 'Manual".

From 'Pause" status, press [▶] + [MENU] together.

The LCD will show 'Element Check/ Go Cancel'. Then select 'Go' and press [ENTER] to execute the test.

The testing will be down once through specified range of element.

Please refer "1) Execution of Element test" in "4-1-6 Other panel setting".

・'#' will be shown on LCD in front of 'Ready/Pause' during the testing.

・By the time of error appearance as the result of the testing, exchanging print head is highly recommended.

・The setting become valid after exiting from Configuration mode.

・The default is set as 'Auto'.

10) Specifying range of Element test : 'Element Limits／□□□□－□□□□'

Function : It specifies the range of element to be tested by dot.

・It is possible to specify the testing range that is actually used currently.

・The setting become valid after exiting from Configuration mode.

・The default is set to '0001 - Max'.

4-1-2 Operation setting mode

Print conditions are set in this mode.

A) Press [PAUSE] after power on to show 'Pause' on LCD.
B) Press [MENU] to get in to the mode.
C) 'Print Speed / □□□mm/s' will be shown on LCD.
D) Press [MENU] to proceed.
E) Press [◀] [▶] keys for selection and press [ENTER] to register.
F) Press [PAUSE] to exit from this mode.

1) Print Speed : 'Print Speed / □□□mm / s'
Function : Set print speed

Speed range
- 300 mm, 250 mm — Available on 4012PMH (300 mm/sec.)
- 200 mm, 150 mm, 120 mm, 100 mm, 80 mm, 60 mm — For high speed ribbon
- 40 mm, 30 mm, 20 mm, 15 mm — For high energy ribbon

・The max print speed differs by printer type. Please refer '5-3-7 Print speed' for the details.
・Please select suitable print speed for the ribbon and label you use to obtain best print quality.
・The settings becomes valid after exiting from Operation mode.

2) Print Mode : 'Print Mode / □□□□□□'.
Function : Selects print mode.

Type	
Standard	Print as feeding labels.
Strip	Print as feeding labels. (Stops at cutting position)
Tear off	Print as feeding labels. (Stops at cutting position and do not execute next printing unless print label is removed.)
Peel off	Peel off the label from backing paper as printing.
Cut off	Cut the label after printing by cutter.

・'Cut off' will only be shown in case of installing cutter option to printer.
・The settings becomes valid after exiting from Operation mode.
・The default is set as "Standard".

3) Print Method : 'Print Method / □□□□'.

Function : Selects printing method.

Type { Transfer — For printing with thermal transfer ribbon.
Direct Thermal — For printing with thermal paper.

- The settings becomes valid after exiting from Operation mode.
- The default is set as "Transfer".

4) Label Type : 'Label Type / □□□□□□'.

Function : Selects paper type to use.

Type { Die cut — For using Die cut label.
Continuous — For using continuous label.

- Continuous label can not be selected in case of printing with peel off mode.
- The setting becomes valid after exiting from Operation mode.
- The default is set as "Die cut".

6) Measure label : 'Measure label / □□□□□'.

(Only displayed when 'Die cut' is selected.)

Function : Select the way of calibrating the paper.

Type {

Every time — Start calibrating label automatically every time the power switch is turned on. It is recommended in case of frequent change of paper type.

Manual — Calibrate the label only when you execute the calibration. It is recommended to save the label to avoid unnecessary calibration by the time of turning on the power switch. (Please refer "3-6 Procedure of operation" for more details.)

Operation — Handle the label with manually input data.

}

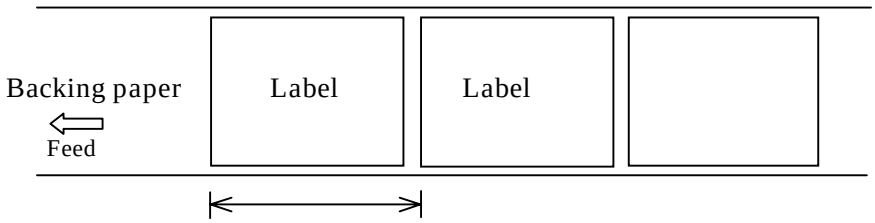
- The settings become valid after exiting from Operation mode.
- The default is set as 'Manual'.

6) Set Label Pitch : 'Set Label Pitch / □□□.□mm'.

Only displayed when 'Operation' or 'Continuous' is selected.

Function : Sets label length.

Value : 000.0 (unit = mm)



Label length(Label length + Gap length)

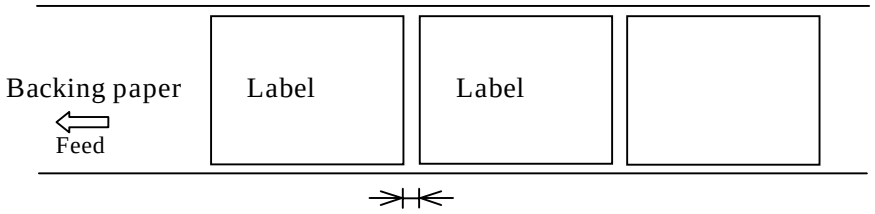
- This mode is displayed only when 'Operation' is selected at 'Measure Label'.
- The settings become valid after exiting from the mode.
- The default is set as 053.0 mm.

7) Set Gap Length : 'Set Gap Length / □□□.□mm'

Only displayed when 'Operation' or 'Continuous' is selected.

Function : Sets Gap length.

Value : 000.0 (unit = mm)



Gap length (The gap between labels)

- This mode is displayed only when 'Operation' is selected at 'Measure label'.
- The settings become valid after exiting from the mode.
- The default is set as 003.0 mm.

8) Left margin : 'Left Margin' / □□□'.

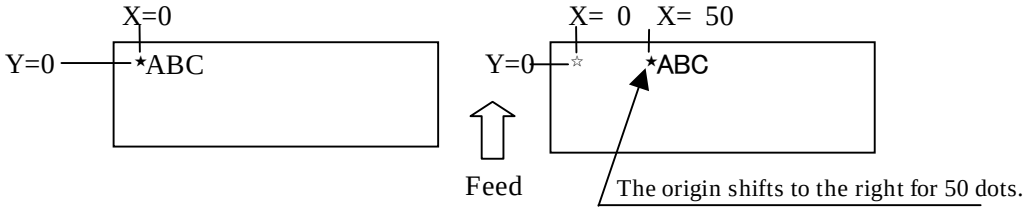
Function : Creates space on left side for the printing.

Range : 0 to total number of element – 1 (dot)

- The print out shift to the right as increasing the value.
- The setting become valid after exiting from the mode.
- The default is set as 0000.

Example :

* The origin of print out.
☆ The origin of label (Left edge of print head)
Left Margin = 0000 Left Margin = 0050



9) Label Skip : 'Label Skip / □□'.
Function : Select how many label absence to be ignored.
Range : 00 to 10 labels
- The setting becomes valid after exiting from the mode.
- The default is set as 01.

10) RS baud rate : 'RS232C Baud Rate / □□□□□□'.
Function : Sets the baud rate.

Range
- 115.2K
- 57.6K
- 38.4K
- 19.2K
- 9600
- 4800

- It need to be matched with baud rate of host PC.
- The setting becomes valid after exiting from the mode.
- The default is set as 9600.

11) RS parity : 'RS232C Parity / □□□□'.
Function : Sets parity bit.

Type
- None For no parity setting.
- Even For even parity setting
- Odd For odd parity setting

- It need to be matched with setting of host PC.
- The setting become valid after exiting from the mode.
- The default is set 'None'.

12) RS Stop bit : 'RS232C Stop Bit / □'.
Function : Sets stop bit.

Type
- 1. Sets stop bit to 1.
- 2. Sets stop bit to 2.

- It need to be matched with the setting of host PC.
- The setting becomes valid after exiting from the mode.
- The default is set '1'.

13) RS data bit : 'RS232C Data Bit / □'.

Function : Sets data bit.

Type { 8 Sets data bit as 8.
7 Sets data bit as 7.

- It needs to be matched with the setting of host PC.
- The setting becomes valid after exiting from the mode.
- The default is set as '8'.

14) RS control : 'RS232C Control / □□□□□□□□'.

Function : Select hand shaking method.

Type { RS / CS Controls by RS / CS signal line.
ER / DR Controls by ER / DR signal line.
XON / XOFF Controls by XON / XOFF code.

RS(RTS) - - - 8 pin Return to send(output). : Requests data to the parity (computer) on the other end line with "SPACE" (ON, about + 7V).

CS(CTS) - - - 7 pin Clear to send(input) : The line shows the preparation for reception of the parity. (Host PC) is ready. "SPACE" (ON, about + 7V) on the line allows to return status.

DR(DSR) - - - 4 pin Data Set Ready (input) : The line shows data to be sent is ready in the parity (Host PC).

ER(DTR)- - - 6 pin Data terminal Ready (output) : The line shows your printer is ready.

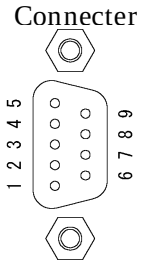
XON - - - Code (11H) Shows the receiver is enable for reception.

XOFF - - - Code(13H) Shows the receiver is disable for reception.

A) Only selected becomes valid.
Ex) In case of setting RS / CS, the XON / XOFF code is not generated.

B) The settings become valid after exiting from the mode.

C) The default is set as 'RS / CS'.



15) LAN setting :

'LAN IP Address', 'LAN Sub Net MSK', LAN Gate way', 'LAN Port Number', and 'LAN Protocol' will appear when LAN interface option is installed.

Please refer LAN interface manual for the details.

4-1-3 Print adjustment mode

Setting of print density and print position are done in this mode.

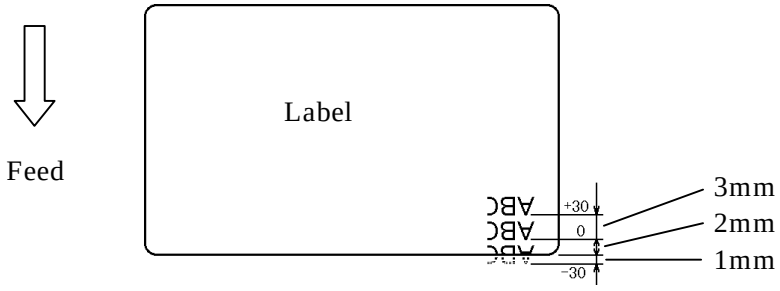
A) Press [PAUSE] to show 'Pause' on LCD.
B) Press [DENSITY / POSITION] to show 'Print Density / +-00'.
C) Press [DENSITY / POSITION] again to proceed.
D) Press [◀] [▶] to change the values and press [ENTER] to register.
E) Press [PAUSE] to exit from Print adjustment mode.

1) Print density ' Print Density / □□□'
Function : Change print density.
Range : - 15 to + 15

The density increase as the value increases.

2) Print position 'Print Position / □□□'
Function : Adjusting print starting position by 0.1 mm.
Range : - 30 to + 30

The print out goes back against feeding direction as increasing the value.

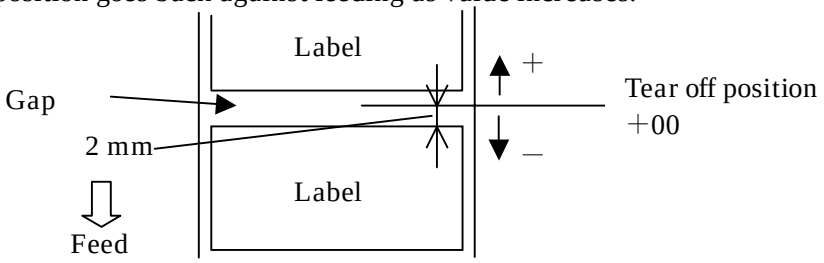


(3) Tear position ' Tear Position / □□□' (Displayed in Tear off / Strip mode.)

Function : Adjusts the stop position of label after printing in Tear off / Strip mode by 0.1 mm.

Range : - 30 to + 30

The position goes back against feeding as value increases.



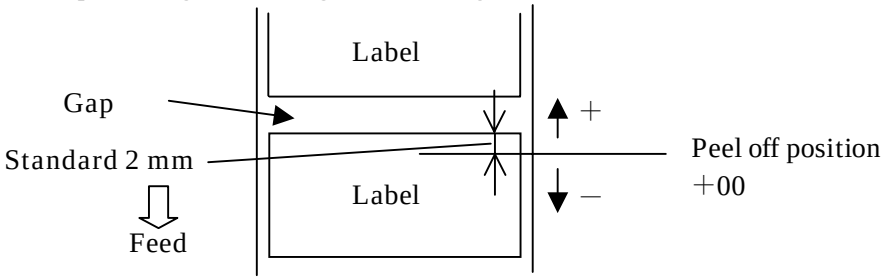
Peel position 'Peel Position / □□□'

Displayed in Peel off mode.

Function : Adjusts the stop position of label after printing in Peel off mode by 0.1 mm.

Range : - 30 to + 30

The position goes back against feeding as value increases.



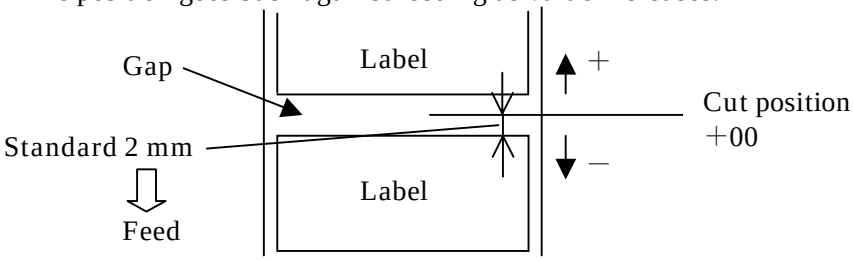
Cut position 'Cut Position / □□□'

Displayed in Cut off mode.

Function : Adjusts the stop position of label after printing in Cut off mode by 0.1 mm.

Range : - 30 to + 30

The position goes back against feeding as value increases.

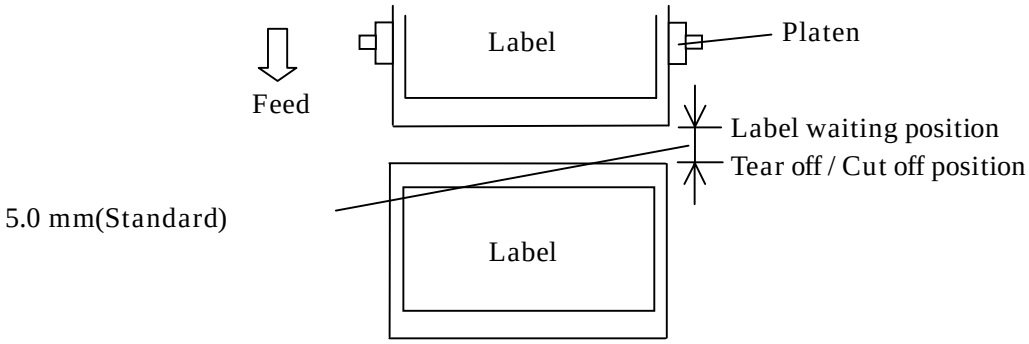


(4) Engulf defense 'Engulf Defense / □□.□mm' (Displayed in Tear off / Cut off mode.)

Function : Adjusts waiting position of label after printing in Tear off / Cut off mode by 0.1 mm.

Range 0 to 99.9 mm.

- The position goes back against feeding as value increases.
- Press ◀ and ▶ to change values and press FEED to shift digit.
- Press ENTER to register.



The default is set as 5.0 mm.

4-1-4 HP adjustment

This printer has function of automatic HP sensor adjustment.
The learned adjustment is registered in printer therefore not necessary to make the adjustment as long as using same paper.

Note : Please make sure to do HP sensor adjustment in case of changing paper type.

The procedure of HP adjustment :
Please follow ① in case of using Die cut label.
Please follow ② in case of using Continuous label.

① In case of using Die cut label :

(1) Load label and ribbon and turn on power switch to show 'Ready' on LCD.
(2) Select 'Label Type' to 'Die Cut'.
   A) Press [PAUSE] to show 'Pause' on LCD.
   B) Press [MENU] several times to show 'Label Type '.
   C) Select 'Die cut' by using [◀] .
   D) Press [ENTER] to register.
   E) Press [PAUSE] to show 'Pause' on LCD.
(3) Executing HP adjustment.
   A) Press [PAUSE] and show 'Pause' on LCD.
   B) Press [CALIBRATE LEVEL] to show 'Calibrate Level / 010 mm'.
   (The default is 010 mm)
   C) Set the value to length of "Label length + 20 mm" by usin [◀] [▶] .
   D) Press [ENTER] to execute the HP level adjustment.
   E) The LCD shows 'Calibrate Level / BUSY !!' and feed labels.
   F) LCD shows 'Ready' as completing HP adjustment.

   Please refer "Chapter 6 Errors" in case of error appearance.

②In case of using Continuous label:

(1) Load only thermal ribbon(Do not load paper) and close print mechanism.
(2) Turn power on.
(3) Change 'Label Type' to 'Continuous' with front panel.
   A) Press PAUSE to show 'Pause' on LCD.
   B) Press MENU several times to show ''Label Type'.
   C) Select 'Continuous' by using ▶ .
   D) Press ENTER to register.
   E) The LCD shows 'Set Label Pitch / 53 mm'.
   F) Press PAUSE to show 'Pause' on LCD.
(4) Executing HP adjustment.
   A) Press CALIBRATE LEVEL to show 'Calibrate Level '.
   B) Press ENTER to execute HP level adjustment.
      G) The LCD shows 'Calibrate Level / BUSY !!' and shows 'Ready' on LCD.
(5) Load label to printer.
   The beep sound will ring as opening head mechanism. Press PAUSE to stop the sound.
(5) Press PAUSE again to show 'Pause' on LCD.
(6) Press PAUSE once again to show 'Ready' on LCD.

Please refer "Chapter 6 Errors" in case of error appearance.

4-1-5 Test print

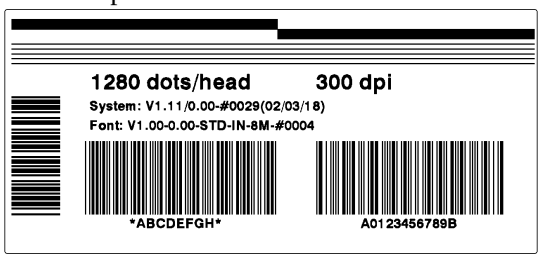
(1) Press [PAUSE] to show 'Pause' on LCD.
(2) Press [◀] [▶] at same time.
(3) 'Test Print / Pattern 1' will be shown on LCD.
(4) Press [▶] in case of selecting 'Test Print / Pattern 2'.
(5) Press [ENTER] to execute the test print.

Press [PAUSE] to stop or restart the test print.
To exit, press [ENTER] and [DENSITY / POSITION] together to reset or turn off the power.

Test print pattern 1 :

Used for print quality adjustment.

Example



Test print pattern 2 :

Used for checking the status of printer.

1) Farm version
2) Font version
3) Mechanism information
4) Maximum print speed
5) Minimum print speed
6) Generation memory amount
7) Print head information
8) Panel setting information

Example

```
01. MODEL INFORMATION
Model Type        = Standard edition
System Version    = 1.11/0.00-#0029(02/03/18)
Font Version      = 1.00-0.00-STD-IN-8M-#0004
Model Code        =  23
Head No.          =  0
Machine No.       =  0
Power Supply No.  = 1
Max Print Speed   = 200mm/s
Min Print Speed   =  15mm/s
Memory Size       =  8MB

02. HEAD INFORMATION
Head Size         = 1280dots/head
Head Density      = 11.800dots/mm
Element Test      = NG
Maker             = KYOCERA
Groupe            = 2
Strobe Dication   = CONT

03. USER MAINTENANCE
Head Resistance   = 1250 Ohm
Total Mileage     =      0m

04. CONFIGURATION
Interface         = RS
Command           = ALL
Character Code    = SFT JIS
HP Sensor         = Transmit
Count Dication    = Repeat
Feed Speed        = +00
Plane Format      = Triple

05. ADJUST
Print Density     = +00
Print Position    = +00
Peel/Cut/TearPos= +00
Engulf Defense    =  5.0mm

06. MOVEMENT MODE
Print Speed       = 100mm/s
Print Mode        = Standard
Print Method      = Transfer
Label Type        = Continuous
Measure Label     = Manual
Set Label Pich    = 200.0mm
Set Gap Length    =  3.0mm
Left Margin       = +00
Label Skip        =  1

07. RS-232C
RS232C Baud Rate= 9600
RS232C Parity     = NONE
RS232C Stop Bit   = 1
RS232C Data Bit   = 8
RS232C Control    = RS/CS

08. LAN
LAN IP Address    = 001.001.001.001
LAN Sub Net MSK   = 000.000.000.000
LAN Gateway       = 002.002.002.002
LAN Port Number   = 00000
LAN Protocol      = FTP
```

4-1-6 Other panel setting

1) Executing Element test :
Starts Element test once when 'Element Check' at Configuration mode is set to 'Manual'.
Steps :
A) From 'Pause' status, press [▶] and [MENU] at same time.
B) LCD will show 'Element Check/ Go Cancel'.
C) Select 'Go' with [▶] and press [ENTER] to execute.
D) LCD will show '# Pause'.

' # ' in front of 'Pause' on LCD indicates that the Element check is in execution.

2) Writing External character (Writing into internal ROM)
It write registered external data into internal ROM.
Once it is written, the external character can be call up even after turning main power off.
The external character can be utilized when '$ Ready' is shown on LCD as well as there is not remaining data in printer.
This is used when 'Ext-Font Save' is set to 'Manual'.

<Operation>
A) Register external character.
B) Make sure the LCD shows '$ Ready' as well as there is no data in printer.
C) Press [ENTER] to start writing the external character into ROM.
READY/STORE LED blinks during the writing.
D) LCD will show 'Ext-Font Entry !! / Wait for ・・・・'.
The writing will takes about 10 to 20 seconds.

3) Reprint :
It is the function to reprint previous format.
It functions when there is no printing data in printer. (After printing)
< Operation >
Press [FEED] from 'Ready' after the printing.
Note : There is option to prohibit reprint available.

4) Reset (Warm start) :

It initializes printer. (However it does not execute the calibration)

< Operation >

Press [DENSITY / POSITION] and [ENTER] at same time.

It will takes about several seconds to complete. So please do not send any data during the resetting.

5) Self printing :

This is the function for demonstration printing available.

'Pattern 1' for Characters and 'Pattern 2' for Barcode are available.

< Operation >

A) Turn on power switch while pressing down [PAUSE] .

B) The LCD shows 'Self Print / Pattern 1'.

C) Press [▶] in case of selecting 'Self Print / Pattern 2'.

D) Press [ENTER] to execute the self printing.

E) To exit, reset or turn of the power.

6) Calibration of label:

This is the function for calibrating label as feeding the label.

Note : HP adjustment is not executed.

< Operation >

A) Turn on power switch while pressing down [FEED] .

B) 'Ready' will be shown on LCD as calibration completes.

C) Please try 'HP adjustment' in case of ' HP Adjust Error'.

7) Label positioning :

This is the function to adjust the label position to print starting position.

< Operation >

A) Turn on power switch while pressing [◀] .

C) 'Ready' will be shown on LCD as completing.

8) Dump print mode :

It prints input data as hexadecimal(HEX). This is used for development use. Please use full width paper as it uses full range for printing out.

<Operation>

A) Press [◀] , [▶] and [ENTER] at same time from 'Ready' status.

B) LCD will show '> Ready' and the further input data will be output as hexadecimal(HEX).

C) To exit, reset or turn power off.

9) Initializing counter :

This is used for clearing counter on LCD to '00000'.

This function is only available when 'Count Dictation' is set to 'Total'.

<Operation>

Press [◀] and [DENSITY/POSITION] at same time from 'Pause' status.

10) Cancellation of data :

This erases data (Receiving data, Generated data or Analyzing data)

<Operation>

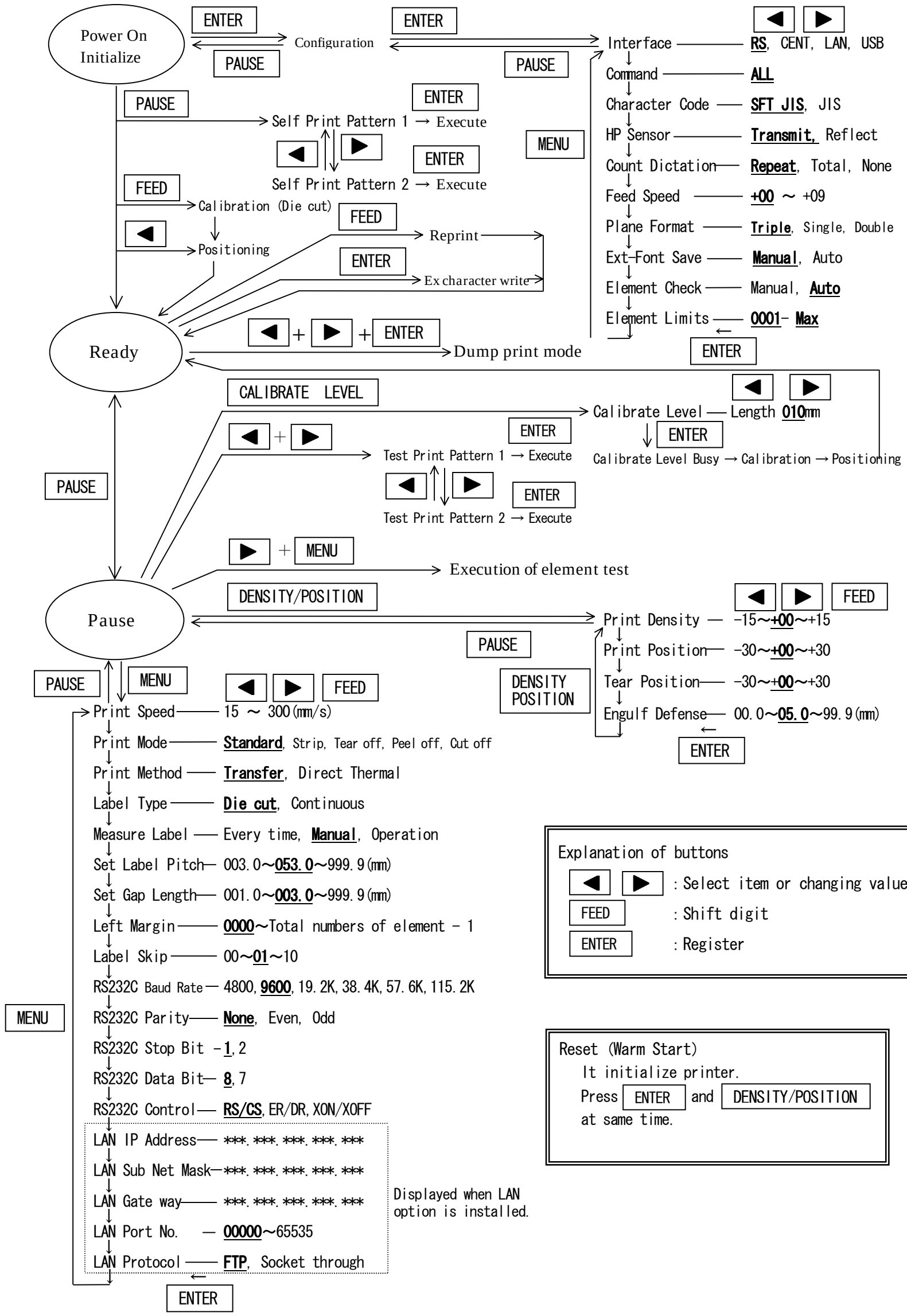
A) Press [◀] and [MENU] at same time from 'Pause' status.

B) LCD will shows 'Quit Printing / Go Cancel'.

C) Select 'Go' with [▶] and press [ENTER] to execute.

4-1-7 Table of panel functions

(Please refer 4-1-1 to 4-1-6 for the details.) The **bold character** represents the default.



4-2 Example of changing panel setting

4-2-1 Changing print density

Turn power on and show 'Ready' on LCD.

LCD display	Panel operation
Ready	
	(1) PAUSE
Pause	
	(2) DENSITY/POSITION
Print Density +00	

(3) Please use following button to change values.
The range is from – 15 to + 15.

▶	Press once to increase 1.
◀	Press once to decrease 1.

(4)	ENTER	Press once to fix the value.

Print Position +00	
	(5) PAUSE
Pause	
	(6) PAUSE
Ready	

This completes the process of changing print density.

4-2-2 Changing print position

Turn on power and show 'Ready' on LCD.

LCD display	Panel operation
Reday	
	(1) PAUSE
Pause	
	(2) DENSITY/POSITION
Print Density +00	
	(3) DENSITY/POSITION
Print Position +00	

(4) Please use followng buttons for changing values.
The range is from – 30 to + 30 (Range of + - 3 mm)

▶	Press once to increase 1.
◀	Press once to decrease 1.

(5) ENTER Press once to register value.

Print Density +00	
	(6) PAUSE
Pause	
	(7) PAUSE
Ready	

This completes the process of changing Print position.

4-2-3 Changing Tear position

'Tear Position' is displayed when 'Strip', or 'Tear off' is chosen as Print mode. 'Peel Position' will be displayed for 'Peel off' mode and 'Cut Position' will be displayed for 'Cut off' mode. The operation stays same however.

Turn on power to show 'Ready' on LCD.

LCD display	Panel operation
Ready	
	(1) PAUSE
Pause	
	(2) DENSITY/POSITION
Print Density +00	
	(3) DENSITY/POSITION
Print Position +00	
	(4) DENSITY/POSITION
Tear Position +00	

(5) Please use following buttons for changing values.
The range is from – 30 to + 30. (Range of + - 3 mm)

▶	Press once to increase 1.
◀	Press once to decrease 1.
(6) ENTER	Press once to fix the value.

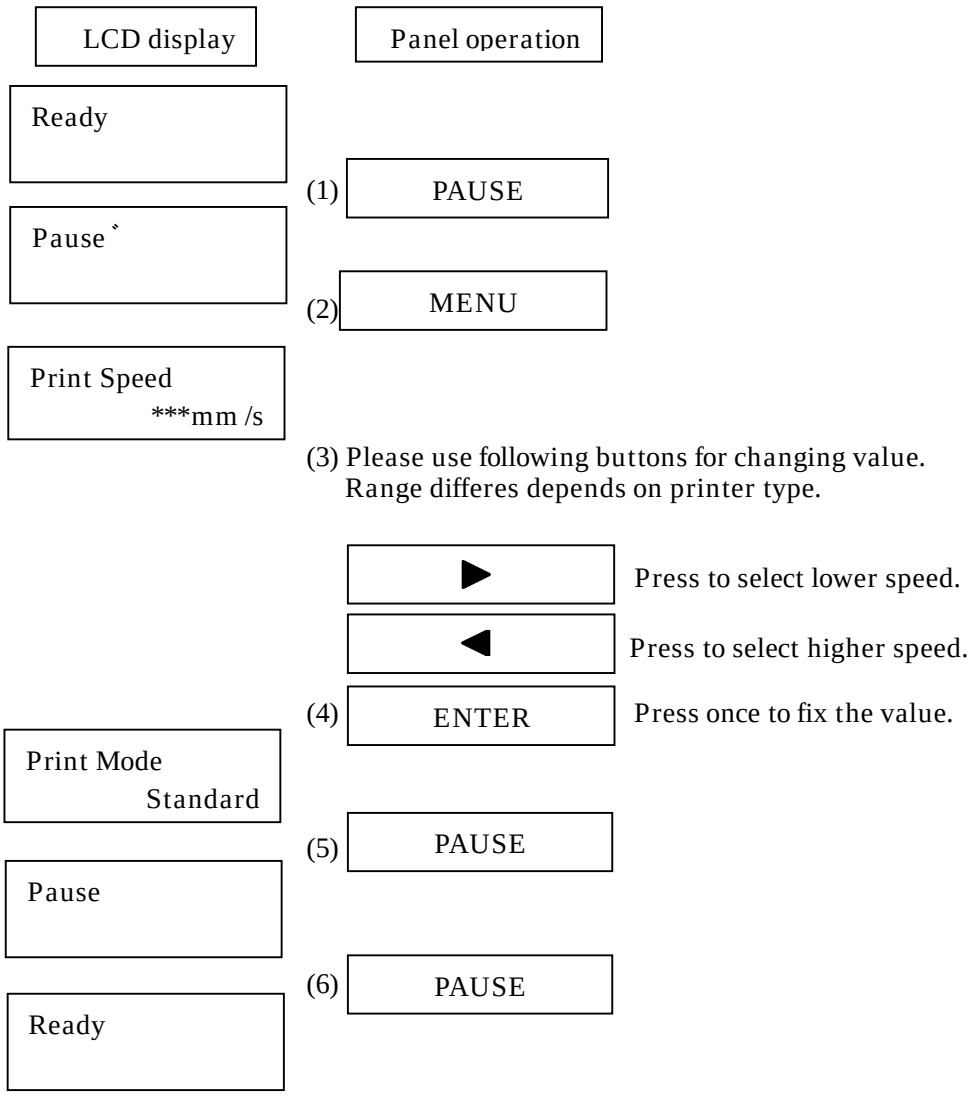
Engulf Defense 05.0 mm	
	(7) PAUSE
Pause	
	(8) PAUSE
Ready	

This completes the process of changing Tear Position.

4-2-4

Changing print speed

Turn on power and show 'Ready' on LCD.



This completes the changing print speed.

4-3 Function of other switch

There are three DIP switch on main board. They are named as DS1, DS2 and DS3. DS1 and DS2 are for internal setting of the printer therefore must not be changed.

1) Explanation of function for DS3

Switch No.	Function	Switch function		Factory setting	
		ON	OFF	Over seas	Domestic
1	LCD display	English	Japanese	ON	OFF
2	—	—	—	—	
3	—	—	—	—	
4	—	—	—	—	
5	—	—	—	—	
6	—	—	—	—	
7	Element Test	Invalid	Valid	OFF	
8	—	—	—	OFF	

Note : Do not change the setting except No. 1 as it might generate some problem on printer functions.

Chapter 5 Specification

5-1 Rating

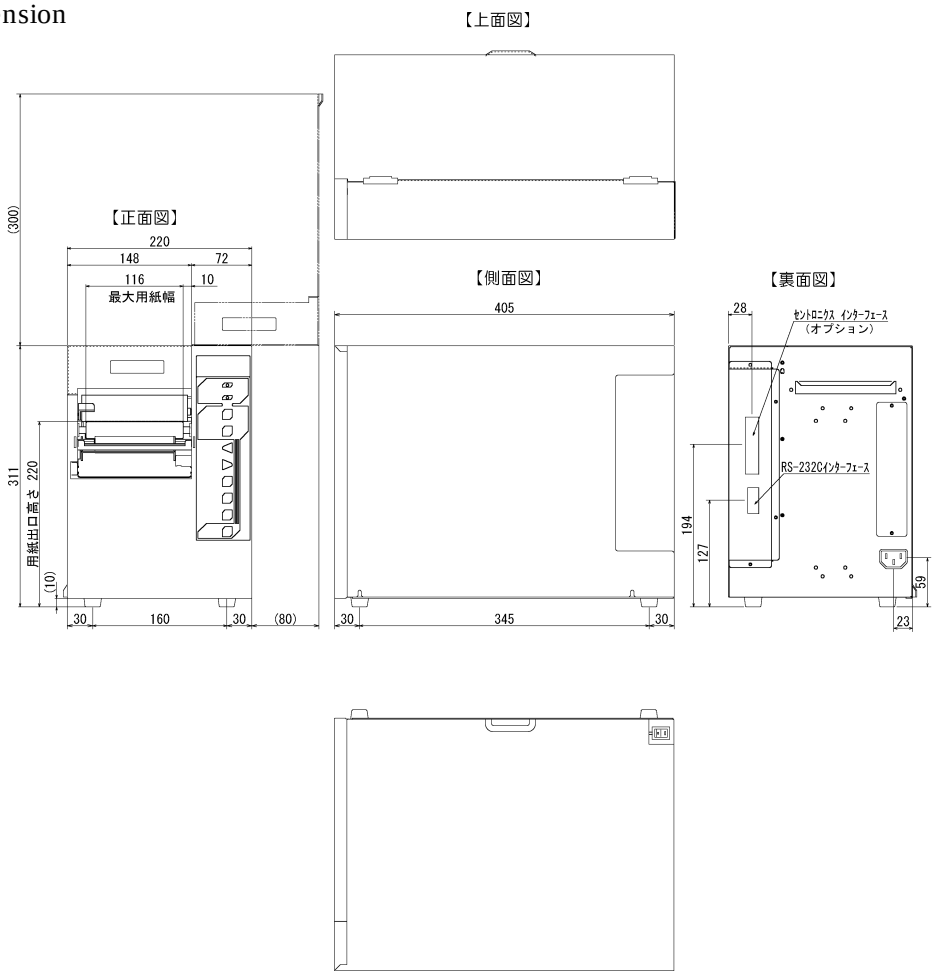
1) Power supply	AC100V to 260V	
2) Rated frequency	50 / 60Hz	
3) Power consumption	About 340VA (Max)	
4) Print media	Recommended paper form by Autonics.	
5) Thermal ribbon	Recommended thermal ribbon by Autonics.	
6) Environment	Operating	:An ambient temperature of 5 to 40℃. Maximum relative humidity of below 85%RH. (No condensation)
	Storage	:An ambient temperature of 0 to 70℃ Maximum relative humidity of below 90%RH.

Note : The storage condition of Media (Label) and thermal ribbon should kept same as printer.

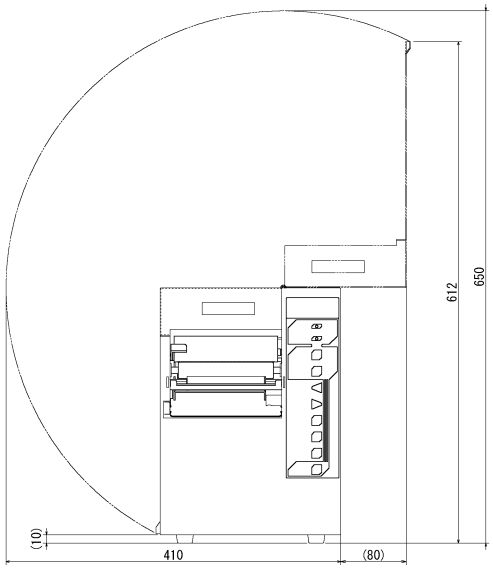
7) Dimensions	220(W) x 311(H) x 405(D) mm (Protrusions are not included)
8) Weight	About 15 kg

5-2 Outer dimensions

1) Dimension



2) Required space



5-3 Print mechanism

5-3-1 Print method

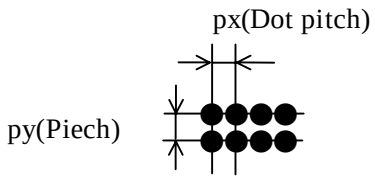
(1) Thermal transfer printing :Use of thermal transfer ribbon
(2) Thermal printing :Use of thermal paper

5-3-2 Print head

Model Name	Print width (mm)	Dot composition			Pitch py(mm)	Note
		Dots/ line	Dot /mm	Dot pitch px(mm)		
4008PMH	104±0.1	832	8	0.125	0.125	
4008PMH	108±0.2	864	8	0.125	0.125	*1
4012PMH	108.4±0.2	1280	11.8	0.0847	0.0847	
4012PMH	105.7±0.2	1248	11.8	0.0847	0.0847	*2
4012PMH	106.2±0.1	1280	12	0.0833	0.0847	
4016PMH	105.7±0.1	1664	15.7	0.0635	0.0635	
4024PMH	105.7±0.1	2496	23.6	0.0423	0.0423	

*1 : Option 8 dot /mm, 108mm
*2 : Option 11.8 dot/mm, 106mm

Element composition



5-3-3 Printer font type

Alphanumeric characters, Kana, Symbol(Defined by JIS C6220), Graphics.
For font type, please refer Table 5-1.
Font size are as followings.

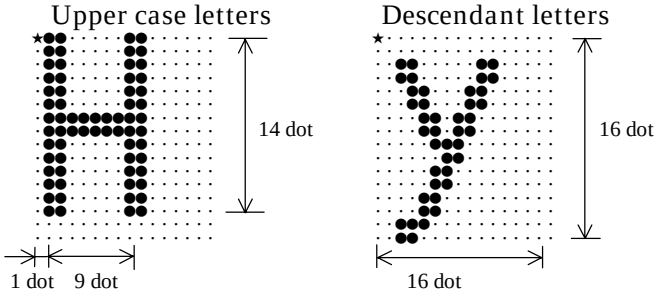
1) 16 x 16 :Dot matrix
2) 16 x 24 :Dot matrix
3) 48 x 60 : Dot matrix
4) 32 x 40 : Dot matrix
5) 24 x 36 : Dot matrix
6) 24 x 24 : Dot matrix
7) 12 x 12 : Dot matrix
8) 8 x 8 : Dot matrix

Table 5-1 Character code table

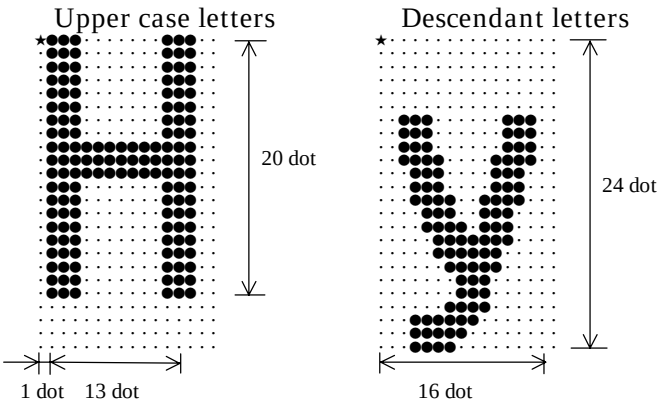
下位4ビット ＼ 上位4ビット	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P		p	▁	ㄴ		ー	タ	ミ	＝	╳
1			!	1	A	Q	a	q	▂	ㄱ	。	ア	チ	ム	ㄴ	円
2			"	2	B	R	b	r	▃	ㅓ	「	イ	ツ	メ	ㅋ	年
3			#	3	C	S	c	s	▄	ㅏ	」	ウ	テ	モ	ㅋ	月
4			$	4	D	T	d	t	■	一	、	エ	ト	ヤ	◢	日
5			%	5	E	U	e	u	■	一	・	オ	ナ	ユ	◣	時
6			&	6	F	V	f	v	■	|	ヲ	カ	ニ	ヨ	◥	分
7			'	7	G	W	g	w	■	|	ァ	キ	ヌ	ラ	◤	秒
8			(	8	H	X	h	x	|	ㄱ	ィ	ク	ネ	リ	♠	
9			)	9	I	Y	i	y	▌	ㄱ	ゥ	ケ	ノ	ル	♥	
A			*	:	J	Z	j	z	▌	ㄴ	ェ	コ	ハ	レ	♦	
B			+	;	K	[	k	{	▌	ㄴ	ォ	サ	ヒ	ロ	♣	
C			,	<	L	¥	l	¦	▌	ㄱ	ャ	シ	フ	ワ	●	
D			-	=	M	]	m	}	▌	ㄴ	ュ	ス	ヘ	ン	○	
E			.	>	N	^	n	~	▌	ㄴ	ョ	セ	ホ	゛	／	
F			／	?	O	_	o		＋	ノ	ッ	ソ	マ	°	＼	

5-3-4 Font size

a) 16 x 16 dots (Font number 1)

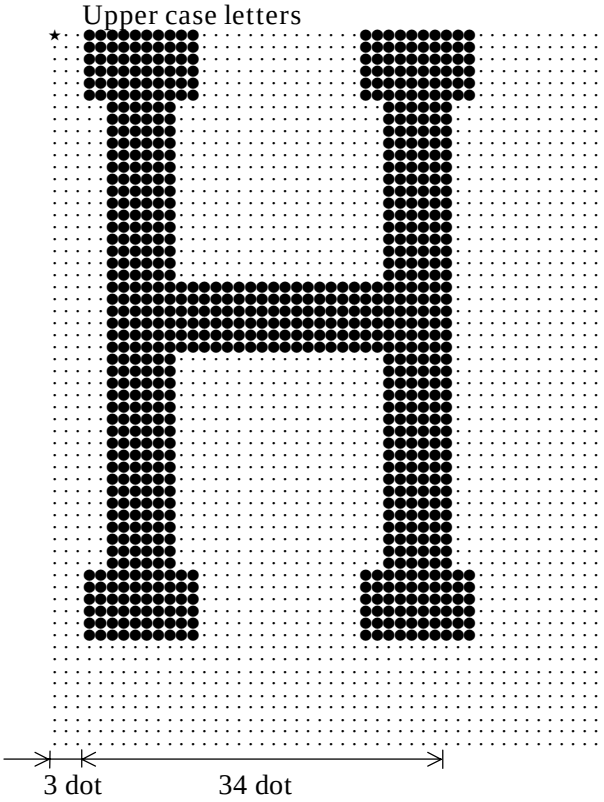


b) 16 x 24 dots (Font number 2)

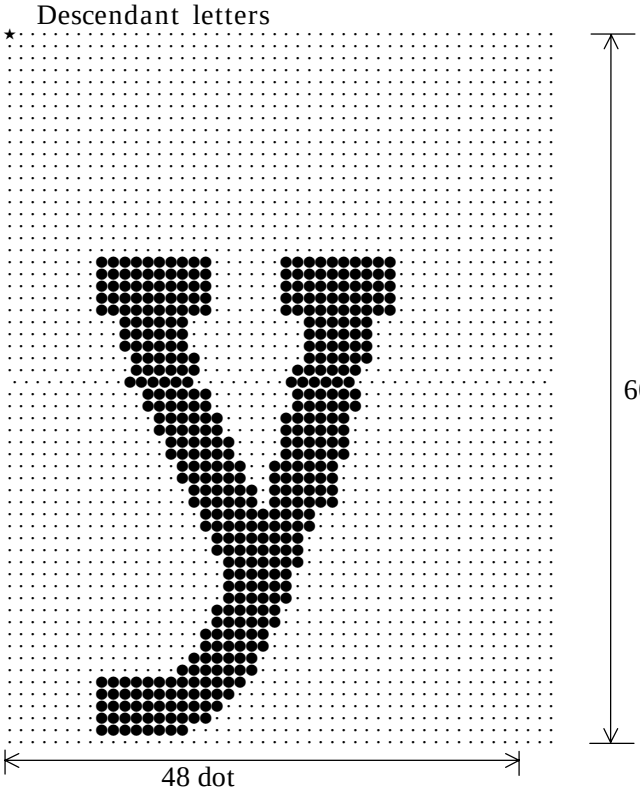


C) 48 x 60 dot (Font number 3)

Upper case letters



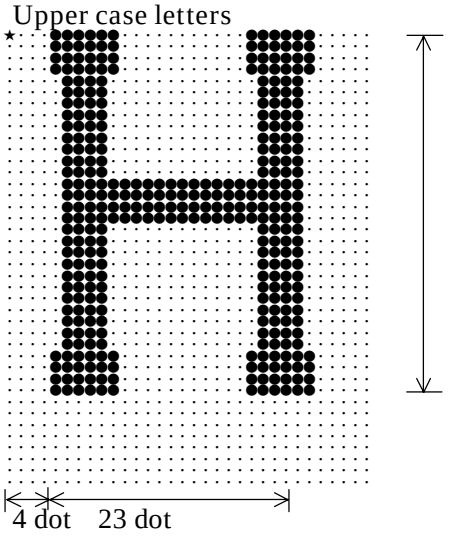
Descendant letters



d) 32 x 40 dot (Font number 4)

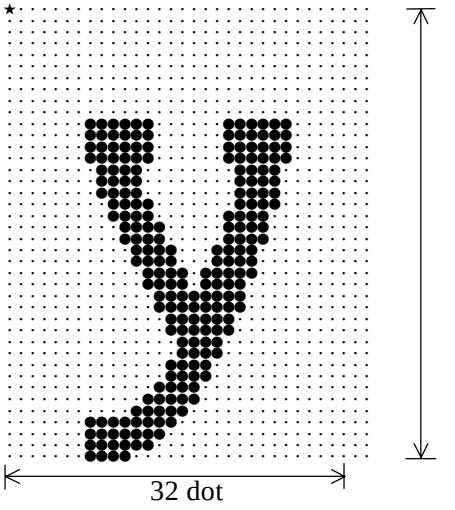
Upper case letters

* shows the original point



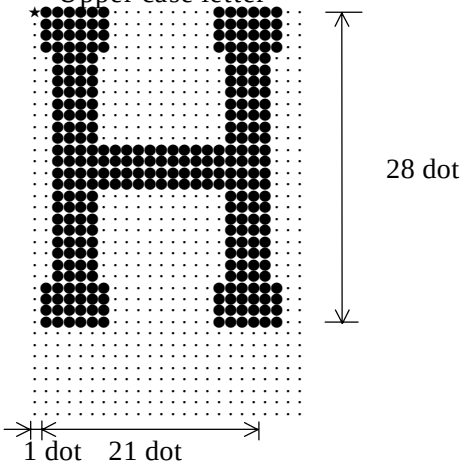
Descendant letter

*shows the original point



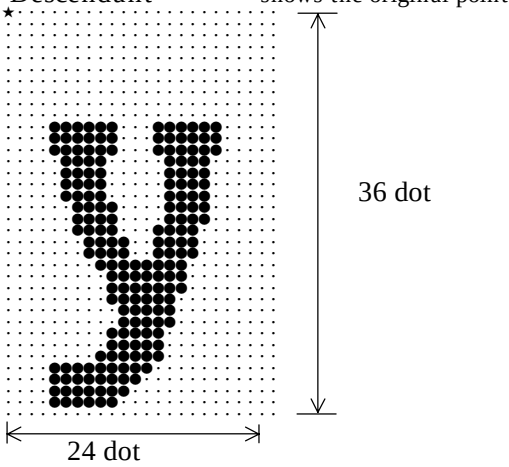
e) 24 x 36 dot (Font number 5)

Upper case letter



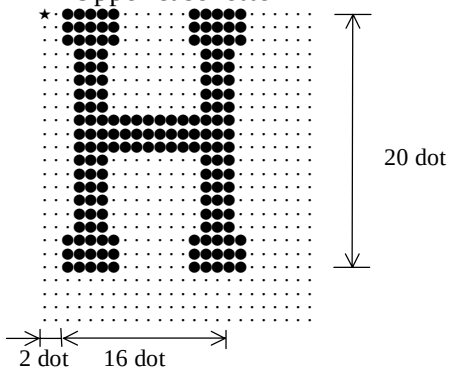
Descendant

shows the original point

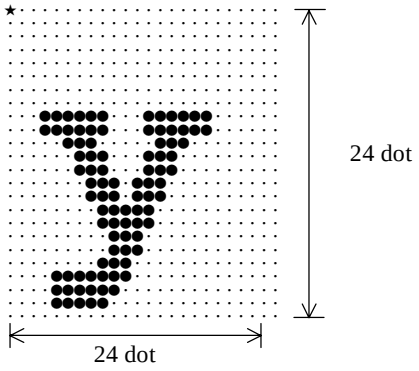


f) 24 x 24 dot (Font number 6)

Upper case letter

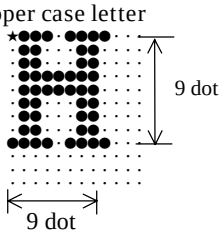


Descendant letter * shows the origin

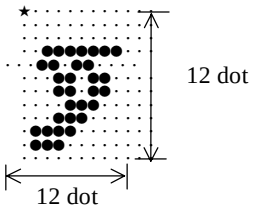


g) 12 x 12 dot (Font number 7)

Upper case letter



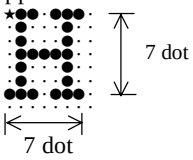
Descendant letter



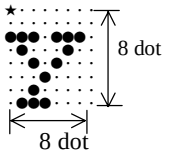
* shows the origin point.

h) 8 x8 dot (Font number 8)

Upper case letter



Descendant letter

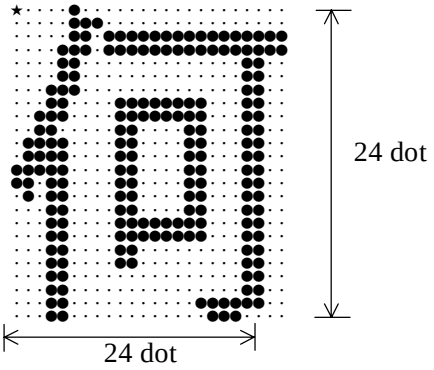


* shows the origin point.

i) Kanji

JIS first standard characters and special characters

JIS second standard characters are embedded. * shows the origin point.



j) OCR B

Alphanumeric character of SIZE I JIS C6250 (Upper case letters only), and optional OCR A characters (alphanumeric uppercase only) can be used as the alternative.

K) External character

24 x 24 dot matrix character	800 characters
4008PMH	About 3mm x 3mm(Only character)
4012PMH	About 2 mm x 2 mm (Only character)
4016PMH	About 1.5 mm x 1.5 mm (Only character)
4024PMH	About 1 mm x 1 mm (Only character)

* The data is erased by turning off the power switch as there is not back up by battery.
It is necessary to write the data into internal ROM to save the data.

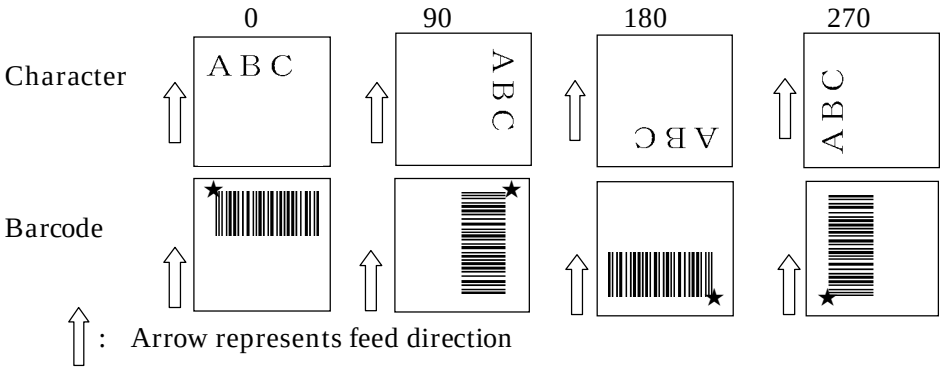
l) Character magnification
Width 1 to 10, and 16 times.
Height 1 to 10, and 16 times.
(Except OCR character)

5-3-5 Available barcode

a) CODE 39
b) NW7 (CODABAR)
c) JAN 13 / 8
d) JAN 13 / 8 with human readable
e) EAN 13 / 8
g) 2 of 5 (Interleaved, Industrial)
h) CODE 93
i) CODE 128
j) PDF417
k) QR Code
l) Veri Code
m) Data Code

5-3-6 Printing direction

Setting moves in a clockwise direction.
0, 90, 180, 270 degrees
Please refer “ALL command reference manual” for the details.



: Arrow represents feed direction

* represents the position of start code.

5-3-7 Print speed

The print speed and default differs by models.

Model	Print Speed range	Default	Note
4008PMH	150mm/s 120mm/s 100mm/s 80mm/s 60mm/s 40mm/s 30mm/s 20mm/s 15mm/s	100mm/s	
4012PMH	300mm/s 250mm/s	100mm/s	Factory option
	200mm/s 150mm/s 120mm/s 100mm/s 80mm/s 60mm/s 40mm/s 30mm/s 20mm/s 15mm/s		
4012PMH	150mm/s 120mm/s 100mm/s 80mm/s 60mm/s 40mm/s 30mm/s 20mm/s 15mm/s	100mm/s	Option 11.8 dot/mm 106mm
4016PMH	120mm/s 100mm/s 80mm/s 60mm/s 40mm/s 30mm/s 20mm/s 15mm/s	100mm/s	
4024PMH	60mm/s 40mm/s 30mm/s 20mm/s 15mm/s	60mm/s	

Note : This is for standard specification.

5-3-8 Print area

Print area is programmable regardless of media type and size.

Model	Print area		Note
	Width(mm)	Length(mm)	
4008PMH	104	999	
4008PMH	108	999	Option 8 dot/mm, 108mm
4012PMH	108.4	999	
4012PMH	105.7	999	Option 11.8 dot/mm, 106mm
4012PMH	106.2	999	
4016PMH	105.7	700	
4024PMH	105.7	320	

Note : This is standard specification.

5-4 Functions

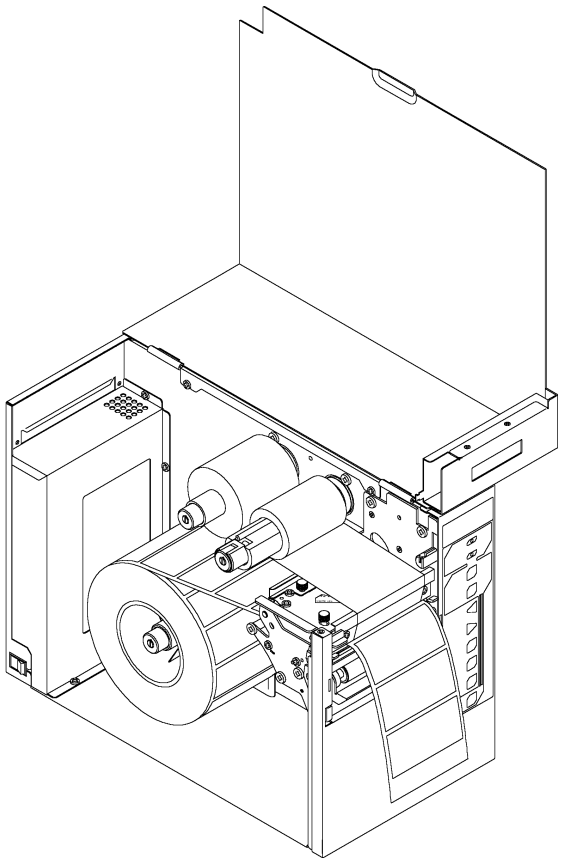
5-4-1 Print mode

The printer has the following ways (mode) to handle paper as print.

1) Standard mode :
Prints labels for specified numbers and stops as completes last label.

2) Strip mode :
Prints label for specified numbers and stops at cutting position. The printer starts printing with back feed of the label to print from top position at the beginning.

3) Tear off mode :
Prints label for specified numbers and stops at cutting position. The printer starts printing with back feed of the label to print from top position at the beginning.
The difference from Strip mode is that printer does not accept next data until removing print label.



4) Peel off mode :
The label is automatically peeled off from backing paper as printing.
The printer starts printing with back feed of the label to print from top position.

5) Backing paper rewinding (The factory option)
This is option to rewind backing paper to optional Re-winder.
This is used for the label that is difficult to peel off.
This is option that function under “Peel off mode”.

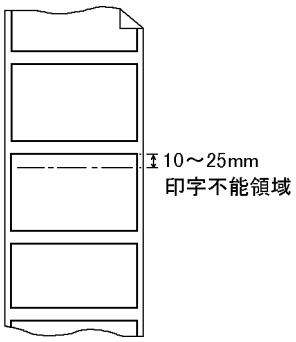
6) Cut off mode : (The factory option)

The label is cut by cutter unit that is attached in front of the printer after printing. The label can be cut by either each label or specified number of labels.

5-4-2 Back feeding

In general, about 10 to 25 mm unprintable area occurs between the print head element and the tear off position. To eliminate the loss, printer has back feed function.

The back feeding is activated in “Peel off”, “Tear off”, “Cut off” mode.



5-4-3 Sensors

(1) Home Position sensor (HP sensor)

This is a sensor to control paper feeding. This is important sensor as it controls Print position, Peel position, Tear position, and Cut position.

(2) Ribbon sensor :

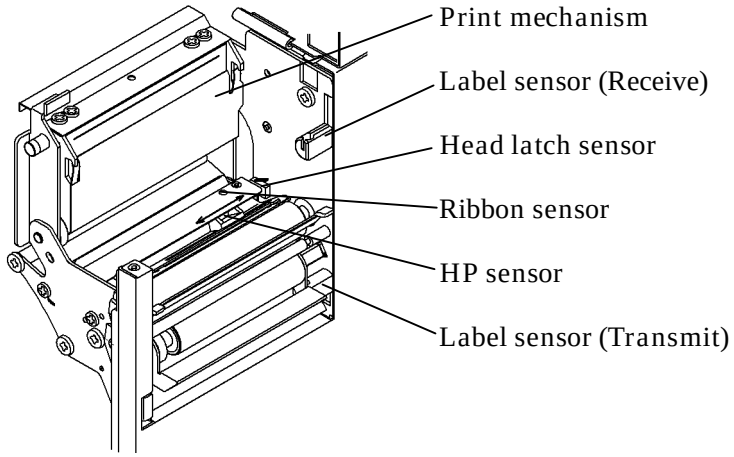
This is a sensor to detect ribbon break and ribbon empty.

(3) Head latch sensor :

This is a sensor to detect head closed.

(4) Label sensor :

This is a sensor to detect existence of paper(label) in “Peel off” or “Tear off” mode.



5-5 Registration of external character

Number of external character	: 800 characters
Character size	: 24 x 24 dot matrix character
4008PMH	: About 3mm x 3mm(Only characters)
4012PMH	: About 2 mm x 2 mm(Only characters)
4016PMH	: About 1.5 mm x 1.5 mm (Only characters)
4024PMH	: About 1 mm x 1 mm (Only characters)

* The data will be erased when power is turned off as there is not back up by battery.
It is necessary to write data into internal ROM to save the data.
Please refer “4-1-6 Implementing external character for the details.

5-6 Optional function

(1) Outline character.
(2) Character font with different size, Ming-cho Kanji(24 x 24)
(3) OCR A character (JIS C6250) Alpha numeric character (Upper case letters only)
(4) Auto cutter
(5) Reflective sensor : Controls paper(Label) by the mark on the paper instead of gap.

5-7 Interface

RS232C interface
Parallel interface
} Select either one

5-7-1 RS232C interface (Compliance)

(1) Data transmission speed(bps) 4800, 9600, 19200, 38400
57600, 115200

(2) Data composition
Data 7bit/8bit
Parity None/Even/Odd
Stop bit 1 / 2 bit

(3) Transmission method Full-duplex channel
Half-duplex channel

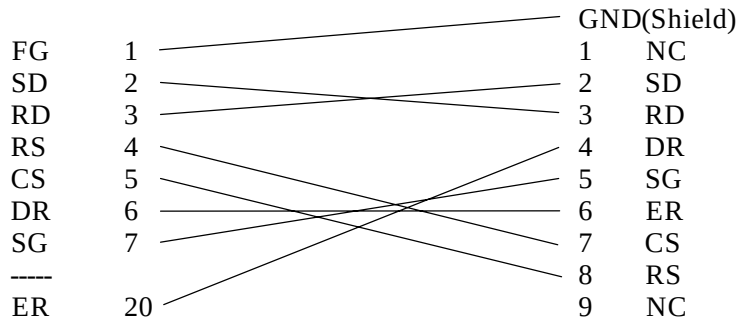
(4) Connecter DE9P Pin (JAE made or compliance)

Table 5-2 Pin assignment table (Pin insert)

Pin No.	Signal name	In/out	Note
1	NC		
2	SD (Send data)	Out	
3	RD (Receive data)	In	
4	DR (Data set ready)	In	
5	SG (Signal ground)		
6	ER (Data terminal ready)	Out	
7	CS (Send ready)	In	
8	RS (Send request)	Out	
9	NC		

(5) Example of connection with PC

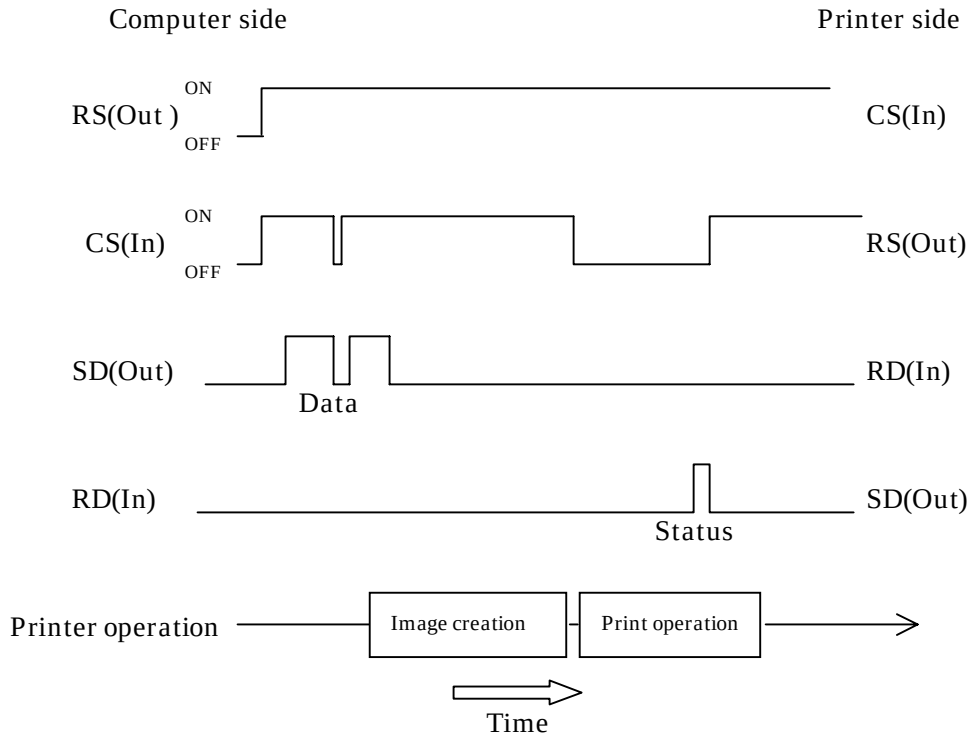
Connection to Host computer (25 to 9 pins connection cable)



Connection to Host computer (9 to 9 pin connection cable)

Computer side (9 pin)			Printer side (9 pin)	
GND(Shield)		——	GND(Shield)	
CD	1	——	1	NC
RD	2	——	2	SD
SD	3	——	3	RD
ER	4	——	4	DR
SG	5	——	5	SG
DR	6	——	6	ER
RS	7	——	7	CS
CS	8	——	8	RS
RI	9	——	9	NC

(6) Timing of data transmission.



(7) RS232C protocol

(a) Initialization (After power on)

Printer : Turn on RS/ER line to wait for receiving data.

Computer : Turn on RS/ER line to set ready for sending data.

(b) Data sending and printing

Prepare image based on data from the computer to perform printing.

The printer cannot receive data from computer during printing.

When RS line of the printer is off, the printer cannot receive data.

(c) Sending the status to computer

1) When required by host computer :

Do not make a status request immediately after the computer sends print data. This is because the printer needs to receive print completion signal previous to status request. The printer also permits the error status request after the error occurrence. After resetting the error, the status is transmitted to the computer.

2) Error occurrence :

The ribbon , paper, or paper jamming error is sent to the computer after printing for one sheet of paper is completed.

3) When errors are recovered :

4) When printing in print area is completed :

Please note that the print head is not positioned at the starting position of printing. Do not send data while RS line of the printer is off (About -7V) even though it seems that the printer make a request for next data.

Note : RS of the host computer should be always kept ON. (About +7V on RS line.)

The status transfer from the printer can happen at any moment. If the computer ignores the status of errors, or the transfer condition of the printer is set to be OFF, the status cannot be transferred correctly.

Check the following two lines from printer to host computer.

1) RS line of the computer is at the ON state. (CS of the printer is ON)

2) ER line of the computer is at the ON state. (DR of the printer is ON)

If both 1) and 2) lines are ON at the same time, the status can be transferred correctly.

If either of two lines is the off state, the status is not transferred correctly.

If you don't need the status, you don't think about the above condition.

If your computer needs status signal with either line to be off, the printer enters into the standby status for data input while the computer is waiting for the status, which may result in stopping in operation.

5-7-2 Parallel interface (Compliance)

(1) Data	8 bit parallel	Positive logic input
(2) Control signal	Strobe signal	Negative logic input
	ACK signal	Negative logic output
	BUSY signal	Positive logic output
	Paper empty	Positive logic output
	Select signal	Positive logic output
	Printer error signal	Negative logic output
(3)Connector	57-40360	(DDK)

Table 5-3 Pin Assignments

Pin No.	Input/ Output	Signal name	Pin No.	Input/ Output	Signal name
1	Input	STROBE (Negative logic)	19		STROBE 0V
2	Input	D0	20		D0
3		D1	21		D1
4		D2	22		D2
5		D3 DATA	23		D3 DATA 0V
6		D4	24		D4
7		D5	25		D5
8		D6	26		D6
9		D7	27		D7
10	Output	ACK (Negative logic)	28		ACK 0V
11	Output	BUSY (Positive logic)	29		BUSY 0V
12	Output	Paper empty (Positive logic)	30		Paper empty 0V
13	Output	Select (Positive logic)	31	Input	Printer reset (Negative logic)
14		NC	32		Print error (Negative logic)
15			33		0V
16			34		NC
17		Frame ground (0V)	35		Pull up to 5V at 5.1k ohm.
18		Pull up to 5V at 22 ohm.	36		NC

Note : Signal level is TTL level

(4) Description of signals :

Strobe : A timing signal for synchronization for data. Negative logic 1 μ.

ACK : Negative logic signal by the time of data input completion.

BUSY : Outputs with positive logic during the data processing.

Paper empty : Outputs with positive logic at “Paper empty”, “Paper jam”.

Select : Outputs with positive logic when power is turned on.

Printer error : Outputs with negative logic by the time of error occurrence.

5-8 Papers and ribbons

5-8-1 Paper types

(1) Paper type

a) Roll type die cut paper

b) Roll type continuous paper

c) Fan fold paper

(2) Paper Type

Please contact us for selecting paper type as there are various kinds of combination of paper type and thermal ribbons.

Before you choose the paper type, be sure to check thermal transfer performance in advance.

If you can choose our standard paper, you can use it in an easier and more carefree manner. Print quality depends on paper type. Generally, use a paper with high surface smoothness.

(3) Paper thickness

0.065 to 0.27 mm. (Includes backing paper)

In case of selecting thick paper, select the one as soft as possible.

5-8-2 Paper size

(1) Paper width (Includes backing paper) and minimum length.

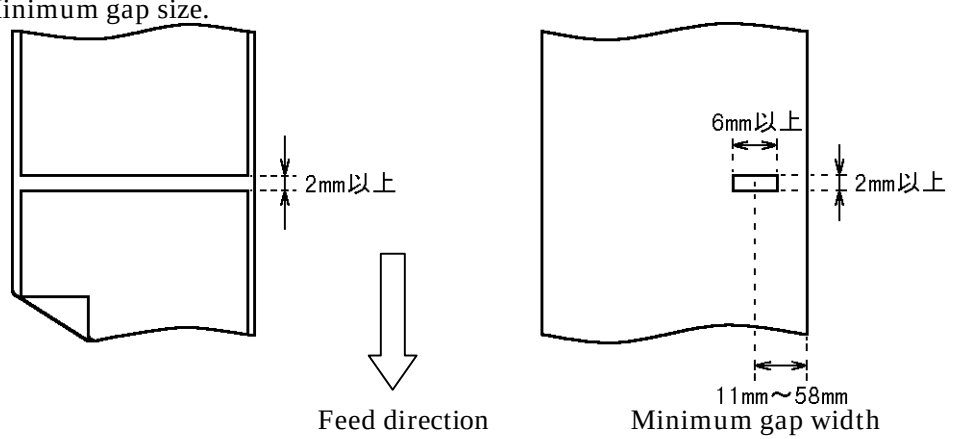
Width : 40 mm to 116 mm

Minimum length :

a) Standard mode	5 mm
b) Peel off mode	25 mm
c) Tear off mode	35 mm
d) Cut off mode	35 mm

Note : Please contact us in case of using shorter length than specified above.

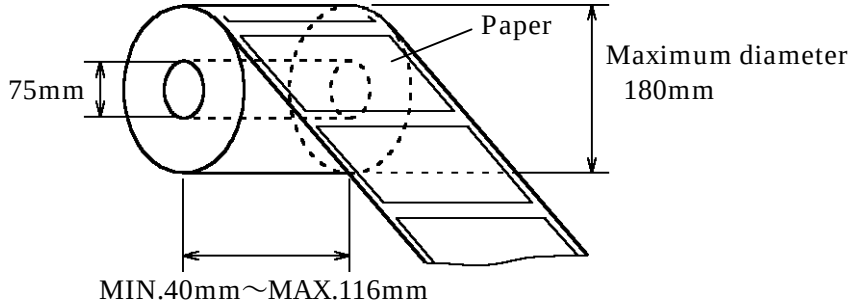
(2) Minimum gap size.



Feed direction Minimum gap width

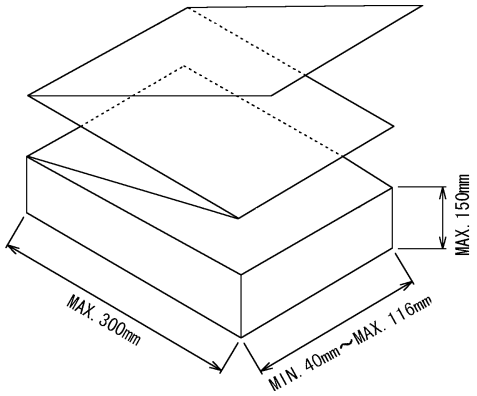
Note : Minimum gap length of 4 mm is needed for using with “Cut off” mode.

(3) Roll size



(4) Fan fold paper size

(Fan fold stocker is an option)

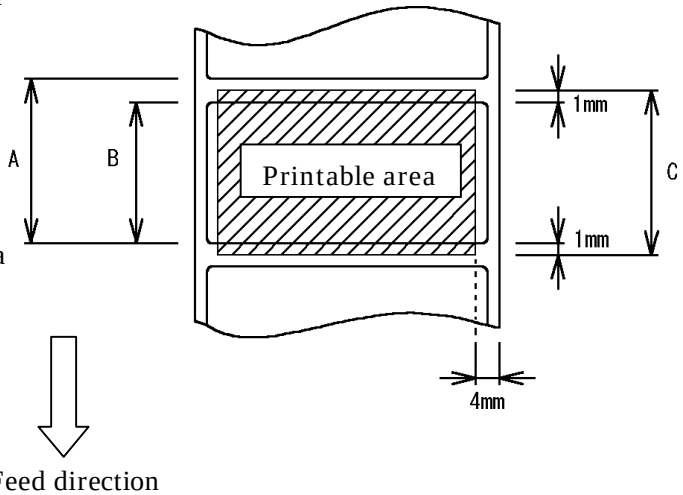


(5) Paper size and print area

A : Label pitch

B : Actual label length

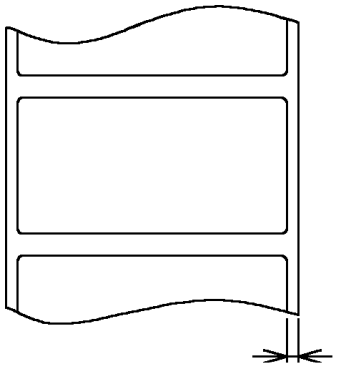
C : Actual printable area
Please refer “5-3-8 Print area”.



Note 1 : Please refer “5-3-8 Print area” and “(1) Paper width and minimum length”0 at “5-8-2 Paper size” for Actual label length B.

Note 2 : Please specify print area to 1mm larger than actual size as there might be some error on calibration and die cutting.

(6) Label position in “Peel off” mode.
At the “Peel off” mode, the distance from the right edge of the label to the right edge of the backing paper must be within 4 mm because of limitation by the installed position of label sensor.



4 mm or less

5-8-3 Thermal ribbon

Thermal ribbon have much influence for not only print quality but also life of print head. It is recommended to use our genuine ribbons.
Also, the warranty does not cover any ribbons except our genuine ribbons.

(1) Ribbon thickness	6 μm / 4.5 μm
(2) Base material	Polyester film
(3) Ink color	Black
(4) Ink	Wax, Resin, and mixture of Wax and Resin.
(5) Length	300 m / 330 m / 450 m
(6) Width	40 mm, 60 mm, 80 mm, 110 mm.
	Please use slightly wider ribbon than paper width.

(7) Please ask us for color ribbons and ribbons with other sizes.

5-8-4 Storage of paper and ribbon

Papers and thermal ribbons should be stored in dust tight plastic bag to prevent the entry of dirt and avoid hot , humid surroundings.
Do not store them for long time as they get degradation.

Chapter 6 Errors

6-1 Error occurrence and error recovery

The followings are list of errors and its recovery methods.

	References
Mechanical errors :	6-1-1
Head open	A)
Level error	B)
Paper empty	C)
Paper jam	D)
Ribbon empty	E)
Over heat	F)
Element break	G)
Cutter error	H)
Communication errors :	6-1-2
Framing error	A)
Parity error	B)
Over Run error	C)
Buffer Full error	D)
Analysis errors :	6-1-3
Syntax error	A)
Parameter error	B)
Other errors :	6-1-4
Mode error	A)
LAN Board error	B)
Receive error	C)

Error handling :

1. When the error occurs, the buzzer always sounds as well as red LED blinks.
2. Some errors are informed to host computer.
3. Errors are classified into following items.
   a) Mechanical error.
   b) Communication error.
   c) Analysis error.
   d) Other errors.

The followings are the check condition, method and how to recover from errors.

6-1-1 Mechanical errors

A) Head open

(1) Check timing :

a) At the time of start up

b) At the time of calibration, feeding, printing

Note : Excludes by the time of "Over heat" error.

(2) How to Check :

Using Head latch sensor.

(3) Cause of the error :

Print mechanism is not closed completely.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection (Print stops)	ON	ON	E01	Head open
Press any button down.	OFF	ON	E01	Head open
Close print mechanism	OFF	ON	E01	Head open
Press 'PAUSE' button down.	OFF	OFF	PAUSE	—
Press 'PAUSE' button down. (Positioning the paper and stat printing)	OFF	OFF	READY	—

B) Level Error

(1) Check timing :

At the time of HP adjustment.

(2) How to check :

Detecting the sensor as feeding paper.

(3) Cause of the error :

a) Using continuous paper.

b) 'Learn Gap Level' is not set properly.

a) HP sensor defection.

b) Using unordinary paper.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection	ON	ON	E15	Level Error
Press any button down.	OFF	ON	E15	Level Error
Open print mechanism and check the paper. Remove the paper if it is continuous paper.	OFF	ON	E15	Level Error
Close print mechanism.	OFF	ON	E15	Level Error
Press 'PAUSE' button down.	OFF	OFF	PAUSE	—
Press 'PAUSE' button down.	OFF	OFF	READY	—
Try HP adjustment again.				

Note : Select Label Type as 'Continuous' in case of using continuous paper.

C) Paper empty

(1) Check timing :
After starting up the system.

(2) How to check :
By detecting the top of the label for feeding certain distance.

(3) Cause of error :
a) No paper
b) HP level is not set properly.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection (Print stops)	ON	ON	E03	PAPER EMPTY
Press any button down.	OFF	ON	E03	PAPER EMPTY
Open print mechanism and set new paper.	OFF	ON	E03	PAPER EMPTY
Close print mechanism.	OFF	ON	E03	PAPER EMPTY
Press 'PAUSE' button down.	OFF	OFF	PAUSE	-
Press 'PAUSE' button down. (Positioning the paper and start printing)	OFF	OFF	READY	-

(5) Please try 'HP adjustment' in case of 'Paper empty' error occurrence.

D) Paper jam

(2) Check timing :
At the time of feeding.

(3) How to check :
By detecting the paper for feeding certain distance.

(4) Cause of error :
a) Paper is not running smoothly.
b) HP level is not set properly.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection (Print stops)	ON	ON	E04	Paper JAM
Press any button down.	OFF	ON	E04	Paper JAM
Open print mechanism and set new ribbon.	OFF	ON	E04	Paper JAM
Close print mechanism.	OFF	ON	E04	Paper JAM
Press 'PAUSE' button down.	OFF	OFF	PAUSE	-
Press 'PAUSE' button down. (Positioning the paper and start printing.)	OFF	OFF	READY	-

(5) The error appears when 3 gaps are not detected after feeding 1000 mm for the calibration.
・Please execute the HP adjustment again.

E) Ribbon empty

(1) Check timing :
At the time of start up.

(2) How to check :
By dictating ribbon empty by sensor.

(3) Cause of the error :
No ribbon.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection (Print stops)	ON	ON	E02	Ribbon empty
Press any button down.	OFF	ON	E02	Ribbon empty
Open print mechanism and set new ribbon.	OFF	ON	E02	Ribbon empty
Close print mechanism.	OFF	ON	E02	Ribbon empty
Press 'PAUSE' button down.	OFF	OFF	PAUSE	—
Press 'PAUSE' button down. (Positioning the paper and start printing)	OFF	OFF	READY	—

F) Over heat

(1) Check timing :
When print starts.

(2) How to check :
a) By detecting head temperature by thermistor.

(3) Cause of the error :
a) Temperature of print head gets to high.
b) Defection of thermistor.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection (Print stops)	ON	ON	E07	Over Heat !!
Press any button down.	OFF	ON	Open print head	Head temperature 69 ℃
Open print mechanism.	OFF	ON	Open print head	Head temperature 69℃
Close print mechanism after buzzer sounds.	OFF	ON	Close print head	Head temperature 59 ℃
Press 'PAUSE' button down.	OFF	OFF	PAUSE	—
Press 'PAUSE' button down. (Position paper and starts printing.)	OFF	OFF	READY	—

Note : The printing will not be executed until temperature goes down.

・The temperature need to go down before next print.
・This error is to protect print head from extensive heating.

G) Element break (Defection of element)

(1) Check timing :

In case of "Auto".

- By the time of power on, reset, waiting status(Excludes during error occurrence and printing)
- The detected element break will be ignored when it recovered but will be detected again when printer is reset or power off.

In case of "Manual"

- By the time of executing element check through front panel operation.

(2) How to check :

- It measures resistance value of each element line on specified range and compares the value to original value.

(3) Cause of the error :

- Defection of element
- When print head is over loaded. (Printing with high print percentage for long time.)

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection	ON	ON	E08 □□□□	Element break
Press any button down	OFF	ON	E08 □□□□	Element break
Press PAUSE button	OFF	OFF	Pause	—
Press PAUSE button	OFF	OFF	Ready	—

- □□□□ tells the location of defected element.

H) Cutter error

(1) Check timing :

When the cutter works at the cut off mode.

(2) How to check :

By detecting the difference of cutter sensor level.

(3) Cause of the error :

Malfunction of cutter. (Paper stuck to cutter unit)

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection (Print stops)	ON	ON	E05	Cutter Error
Press any button down.	OFF	ON	E05	Cutter Error
Turn power off.	OFF	—	—	—
Remove paper when it is stuck in to cutter unit. If not, check the cutter connector.	—	—		—
Turn power on.	OFF	OFF	READY	—

Note : The received data will be lost after the turning off the power.

6-1-2 Communication errors

A) Framing error

(1) Check timing :

When receiving data from host computer at 'Ready' position (RS232C connection)

(2) How to check :

By detecting framing error.

(3) Cause of the error :

The communication speed (Baud rate) is not matching with host computer.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection (Stops data receiving immediately)	ON	ON	E51	Framing error
Press any button down.	OFF	ON	E51	Framing error
Reset by power switch (OFF / ON)	OFF	OFF	READY	—
Set communication condition again by front panel.	OFF	OFF	READY	—
Power switch on again.	OFF	OFF	READY	—

Note :The date will be lost after turn off the power switch.

B) Parity error

(1) Check timing :

When receiving data from host computer at 'Ready' position.
(RS232C connection)

(2) How to check :

By detecting parity error.

(3) Cause of the error :

The communication condition (RS232C Parity) is not matching with host computer or some data is defected.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection (Stops data receiving immediately)	ON	ON	E52	Parity error
Press any button down.	OFF	ON	E52	Parity error
Reset by power switch (OFF / ON)	OFF	OFF	READY	—
Set communication condition again by front panel.	OFF	OFF	READY	—
Power switch on again.	OFF	OFF	READY	—

Note : The data will be lost after turn off the power switch.

C) Over run

(1) Checking timing :
When receiving data from host computer at 'Ready' position.
(RS232C connection)

(2) How to check :
By detecting problem during internal processing.

(3) Cause of the error :
The new data is input before completing the process of current data.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection	ON	ON	E53	Over run
Press any button down.	OFF	ON	E53	Over run
Reset by power switch. (OFF / ON)	OFF	OFF	READY	—
Set communication condition again by front panel.	OFF	OFF	READY	—
Power switch on again	OFF	OFF	READY	—

Note : The data will be lost after turn off the power switch.

D) Buffer Full

(1) Check timing :
When receiving data from host computer at 'Ready' position.

(2) How to check :
By receiving new data when receiving buffer is full.

(3) Cause of the error :
By receiving new data when receiving buffer is full.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection	ON	ON	E54	Buffer Full
Press any button down.	OFF	ON	E54	Buffer Full
Power switch on again	OFF	OFF	READY	—

a) The error occurs when sending data exceeds 256 byte.
b) Please check communication condition and cables.
c) The error occurs when remaining memory become 256 byte in X ON / X OFF mode.
d) Reset by power switch to recover.

Note : The data will be lost after turn off the power switch.

6-1-3 Analysis errors

A) Syntax error

(1) Checking timing :

When analyzing received data.

(2) How to check :

By comparing with command specified data.

(3) Cause of the error :

Mistake on command data or communication data become garbage.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection	ON	ON	E55 □□□	Syntax error
Press any button down	OFF	ON	E55 □□□	Syntax error
Power switch on again.	OFF	OFF	READY	—
Setting external command again.	OFF	OFF	READY	—

Note :□□□ represents error command. Reset by power switch.
The data will be lost after turn power switch off.

B) Parameter error

(1) Check timing :

When analyzing host data.

(2) How to check :

By analyzing argument of command.

(3) Cause of error :

a) Mistake on format or definition of data.

b) Data become garbage.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection	ON	ON	E56	Parameter error
Press any button down.	OFF	ON	Contents of error detection	
Power switch on again.	OFF	OFF	READY	—
Setting external command again.	OFF	OFF	READY	—

Note :The contents of error will be displayed on LCD. Please check the contents and rest by power switch. The data will be lost after turn power switch off.

6-1-4 Other error

A) Mode error

(1) Check timing :

At the time of start up.

(2) How to check :

By detecting utility (Cutter, USB etc.) during initialization.

(3) Cause of the error :

The selected utility is not available.

(4) How to recover :

How to recover	Beep sound	ERROR LED status.	LCD	
			Upper	Lower
Error detection	ON	ON	E09 □□□	Mode error
Press any button down.	OFF	ON	Print mode	Cutter
			Interface	USB
Turn power switch again.	OFF	OFF	READY	—
Set front panel again	OFF	OFF	READY	—

a) □□□

b) Pressing [PAUSE] will display the contents of error.

c) Turn off the power and check utilities.

d)The print mode will be changed to 'Standard' after showing 'Print mode Cut off' on LCD.

e)The interface will be changed to 'RS' after showing 'Interface USB error' on display.

B) LAN Board error

(1) Check timing :

a) When power switch is on. (Initialization)

b) When changed the settings by front panel or by command.

(2) How to check :

By detecting existence of LAN board.

(3) Cause of the error :

a) The setting is invalid.

b) No. LAN board.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection	ON	ON	E 67	LAN Board error
Press any button down	OFF	ON	E 67	LAN Board error
Reset by power switch	OFF	OFF	READY	—

C) Receive error.

(1) Check timing :

When receiving the data from host. (LAN connection)

(2) How to check :

By detecting framing or parity error during internal processing of data.

(3) Cause of the error :

LAN setting does not match to host computer.

(4) How to recover :

How to recover	Beep sound	ERROR LED status	LCD	
			Upper	Lower
Error detection	ON	ON	E60 LAN	Receive error
Press any button down	OFF	ON	E60 LAN	Receive error
Press 'PAUSE' button down	OFF	OFF	PAUSE	—
Turn power switch again.	OFF	OFF	READY	—

Chapter 7 Maintenance

7-1 Cleaning and routine check

Preparation (1) Ethyl alcohol / Neutral detergent
(2) Gauze (Soft cloth) / Cotton swabs
Using the other solvents (such as thinner, toluene) might cause deformation or discoloring.

7-1-1 Cleaning and routine check on print head

Cleaning steps (1) Open print mechanism.
(2) Dip cotton swabs or gauze into ethyl alcohol.
(3) Clean element part of print head.

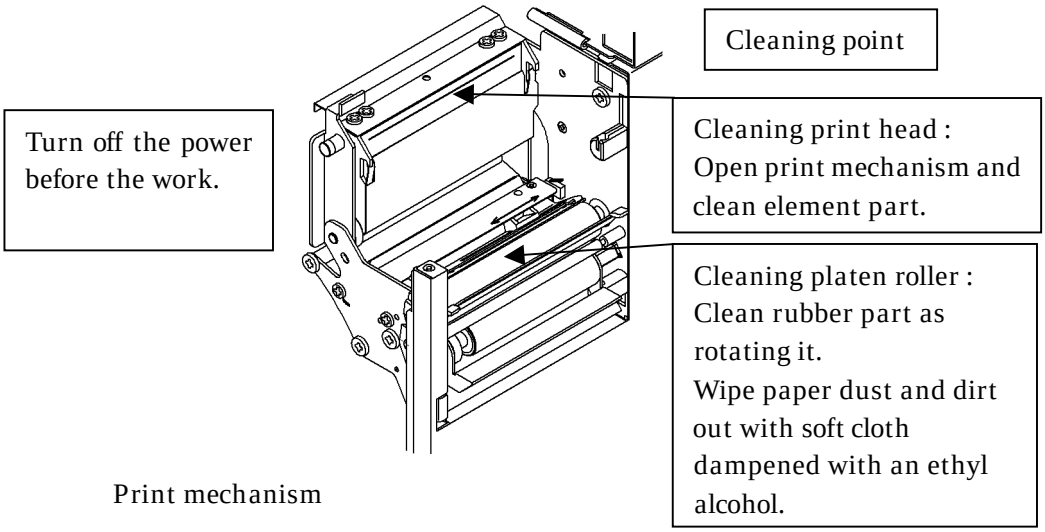
Checking print head Please check any damage on each part such as element during the clean up.
Try test print after the clean up to see if it prints completely.

7-1-2 Cleaning and routine check on platen roller

It is recommended to clean the platen roller once a day.

Cleaning steps (1) Open print mechanism.
(2) Dip cotton swabs or gauze into ethyl alcohol.
(3) Wipe the platen out as rotating it.

Checking platen roller Please check any damage or dirt during the cleaning.
Replace the platen to new in case of damaged.


Cleaning point
Turn off the power before the work.
Cleaning print head : Open print mechanism and clean element part.
Cleaning platen roller : Clean rubber part as rotating it. Wipe paper dust and dirt out with soft cloth dampened with an ethyl alcohol.

Print mechanism

7-1-3 Cleaning inside and outside of printer

Wipe dirt out with soft cloth dampened with an ethyl alcohol or neutral cleaner. Make sure that there is no dirt on the path of ribbon and paper.

7-2 Handling and replacing print head

(1) The print head has its own life. It is necessary to replace it in case of defection. (Replace for value)

Handling instruction of print head :

1. Do not force to rotate the platen roller without ribbon and paper installed on print mechanism closed.
2. Clean the print head once a day, at the time of label replacement, or at the time of trouble of ribbon running.
3. Try not to use ribbon and paper that is not recommended by Autonics.
4. Keep out dust especially powder from grinder, sand paper, or grains of sand paper from print mechanism.
5. Do not touch the print head with firm materials such as metal.
6. Try not touch the print head element by hand as it hates oils, fats and salt.

(2) Contact us or your nearest Ring authorized dealer for exchanging the print head.

7-3 Consumable parts

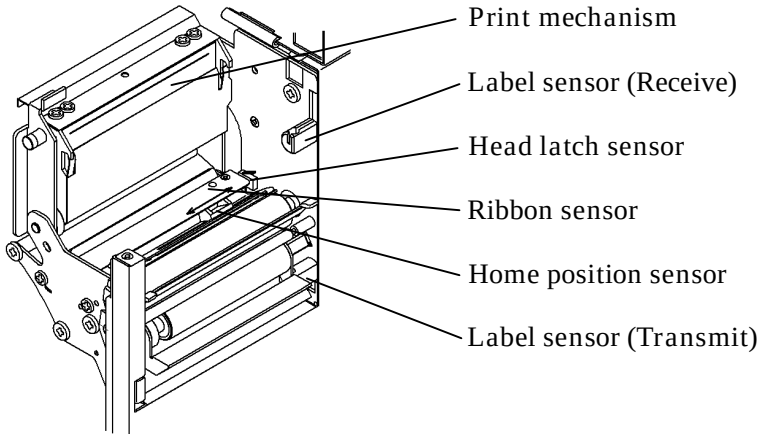
Print head
Platen roller
Peel off roller
Felt pad
Timing belt

} These components are on chargeable basis. (Out of warranty)

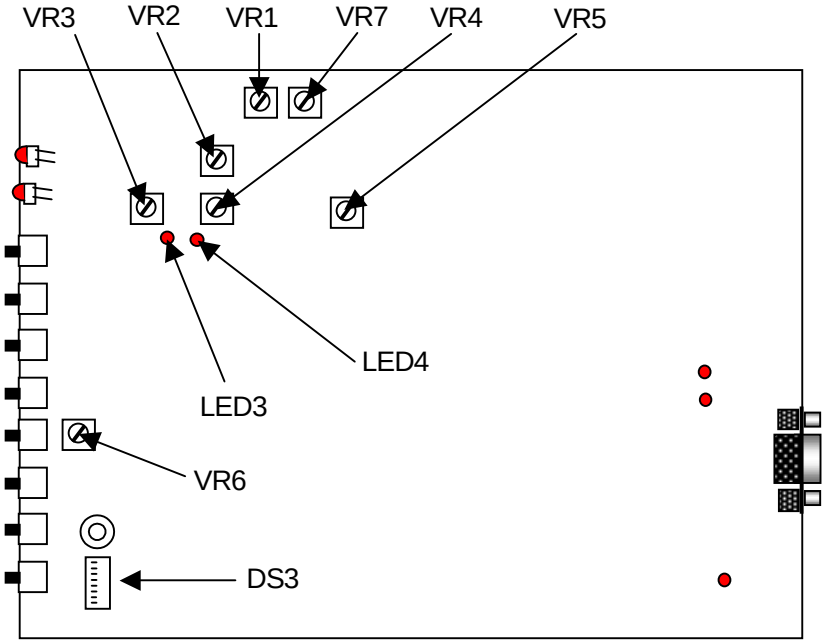
7-4 Adjustment of sensors

The sensors are set properly previous to the shipment therefore it is not necessary to be re adjusted in usually.

Position of sensors



The volumes and LED are located as below.

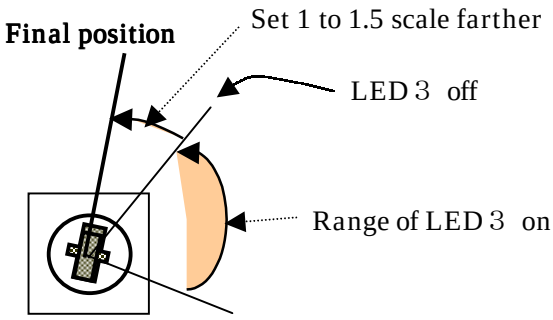


Function of adjustment volumes :

VR1	: Adjustment for HP sensor sensitivity. (Receiver)
VR2	: Adjustment for light amount of Ribbon sensor.
VR3	:Adjustment for detection level of Label sensor.
VR4	:Adjustment for detection level of Ribbon sensor.
VR5	: Adjustment for HP sensor light amount.
VR6	:Adjustment for the contrast of LCD.
VR7	: Off set adjustment of HP sensor receiving level.

1) Adjustment of Ribbon sensor :
   1. Remove the ribbon and close print mechanism.
   2. Measure check pin TP3 and TPG1(GND) by volt meter. Turn VR2 to counter clockwise from far right and stop at 0.9V.
   3. Turn VR4 to counter clockwise from far right and stop when LED4 turns on.
   4. Load ribbon to the printer and measure TP3 and TPG1(GND). Check if the voltage is above 3.5V.

2) Adjustment of Label sensor :
   1. Remove the paper from the sensor.
   2. Turn VR3 counter clock wise from far right and stop when LED 3 turns off.
   3. Load paper to printer and check if LED3 turns on.



3) Adjustment of LCD contrast :
   View the LCD from slightly above and turn VR6. Stop turning VR6 at the proper position.